

N62 - 19170

2914-1-T  
Copy No. 477

# THE UNIVERSITY OF MICHIGAN

## COLLEGE OF ENGINEERING

### DEPARTMENT OF ELECTRICAL ENGINEERING

#### Radiation Laboratory

## ATLAS OF THE FAR SIDE OF THE MOON

(Publication of the Academy of Sciences of the USSR,  
Moscow, 1960).

Editors.

N. P. Barabashev, A. A. Mikhailov, Y. N. Lipsky

*Translated by Nadya Winkels - January 1961*

The formations of the far side of the moon as shown on  
photographs obtained by the Automatic Interplanetary  
Station (AIS) on 7 October 1959.

Report No. 2914-1-T  
on Grant NSG-4-59



A theoretical investigation of the use of radar in mapping  
planetary surfaces and to determine conductivity,  
permittivity, and permeability of planetary surface materials

**Grant With:**

National Aeronautics and Space Administration  
Washington 25, D. C.

**Administered through:**

OFFICE OF RESEARCH ADMINISTRATION • ANN ARBOR

N62-10170

THE UNIVERSITY OF MICHIGAN

2914-1-T

ATLAS OF THE FAR SIDE OF THE MOON

(Publication of the Academy of Sciences of the USSR, Moscow, 1960).

Editors:

N. P. Barabashev, A. A. Mikhailov, Y. N. Lipsky

Translated by Nadya Winkels - January 1961

The formations of the far side of the moon as shown on photographs  
obtained by the Automatic Interplanetary Station (AIS) on 7 October 1959.

2914-1-T

on

Grant NsG - 4 - 59

A theoretical investigation of the use of radar in mapping planetary  
surfaces and to determine conductivity, permittivity, and permeability  
of planetary surface materials

Prepared for

National Aeronautics and Space Administration  
Washington 25, D. C.



TABLE OF CONTENTS

INTRODUCTION	1
RESULTS OF PROCESSING OF THE FIRST PHOTOGRAPHS OF THE FAR SIDE OF THE MOON	3
Characteristics of the Original Materials and Photographs	3
The Methods of Increasing the Information Properties of the Photographs Transmitted by the AIS	15
Photometric Cross Sections of Photographs of the Far Side of the Moon	20
Analysis of the Material	32
CATALOGUE OF THE FORMATIONS SHOWN ON THE FAR SIDE OF THE MOON	42
Objects of the First Order of Certainty	43
Objects of the Second Order of Certainty	101
Objects of the Third Order of Certainty	134
PHOTOGRAPHS OF THE FAR SIDE OF THE MOON	143
MAP OF THE FAR SIDE OF THE MOON	164

## INTRODUCTION

On October 4, 1959 a third cosmic rocket was successfully launched in the Soviet Union, which put the first automatic interplanetary station in the world into an orbit that curved around the Moon. Equipped with a complicated complex of scientific apparatus, including photographic and television, the automatic interplanetary station passed near the Moon. The system of orientation of the automatic interplanetary station made it possible to photograph that part of the lunar surface that is not visible from the Earth.

It was necessary for the groups of soviet scientists, engineers, technicians and workers who created the cosmic rocket, to solve a number of the most difficult scientific-technical problems, which made it possible not only to put the automatic interplanetary station into the calculated orbit with the necessary accuracy, but to successfully carry out the projected program of investigation.

Photographing of the far side of the Moon's surface began by special command as the Moon was being encircled and continued for forty minutes.

Thus the first photographs of the far side of the Moon were obtained. Development of the methods of study of these photographs in order to detect the details of the lunar surface, compilations of the catalogue with descriptions of the particularities of the new objects, establishment of the coordinate relations and drawing of the map were carried out in Moscow by the P. K. Sternberg Astronomical Institute (project supervisor - Y. N. Lipsky) together with the

Central Scientific Research Institute of Geodesy, Aerophotography and  
Cartography (project supervisor - N. A. Sokolova).

The same work was carried out simultaneously and independently in  
Pulkova by the Main Astronomical Observatory of the Academy of Sciences of the  
USSR (project supervisor - A. V. Markov) and in Kharkov by the Astronomical  
Observatory of the A. M. Gorkii State University of Kharkov (project supervisor  
- N. P. Barabashev).

RESULTS OF PROCESSING OF THE FIRST PHOTOGRAPHS  
OF THE FAR SIDE OF THE MOON

## Characteristics of the Original Materials and Photographs

As is known, photographs of the far side of the Moon were obtained by the first soviet automatic interplanetary station (AIS) [1, 2]. The photography was carried out by an apparatus having two objectives whose focal lengths and relative openings were equal to 200 mm and 1:5.6 and 5 mm and 1:9.5 respectively. The photographic apparatus was so mounted in the AIS that the optical axes of both objectives were parallel. A special orientating system, which included optical and gyroscopic counters, logical electronic devices and operating motors, made it possible to aim the optical axes of the objectives at the Moon at the necessary time and to keep their orientation correct during the entire time of photographing.

In photographing the far side of the lunar surface, it was naturally attempted to obtain at least the larger portion of that side in each shot, if not the whole far side. Obviously, this goal could be achieved only when the phase of the Moon (with respect to the AIS) was close to full moon. Moreover, the larger the part of the far side of the lunar surface that is illuminated by the Sun, the smaller the number of details of the visible side that is illuminated and can be photographed. However, in order to reliably decipher the photographs, it was very important to have them include portions of the well-known visible side of the Moon. Furthermore, it was essential that these known regions be situated sufficiently far

away from the limbs and not at the disc's edge, where distortion of perspective is great. This last is important for several reasons.

The presence of details on the photographs situated at a significant distance from the limbs, which are ordinarily visible from the Earth in the peripheral and libration zones in greatly distorted form with respect to perspective, would make it possible to increase our information concerning these objects. Not only the form of these details, but their structure, coordinates, etc., could be established more accurately.

This problem cannot be solved by observations from the Earth. The study of specific particularities of the images of details in photographs transmitted from the AIS, the form and structure of which details have been well studied in photographs taken by earth observatories, would make it possible to more reliably interpret the objects situated on the far side of the Moon. The portions of the photographs with the indicated details could serve as a sort of "deciphering standard" for all newly revealed formations. Besides this, a significant number of known objects, for which selenographic coordinates have been reliably determined from measurements carried out in the Earth observatories, should be present in the photographs transmitted by the AIS. This is important for making up a map of the far side of the moon.

Actually, if the photographs contain a large number of details whose coordinates are well known, it is possible to reliably oriente a coordinate network with respect to them and in this way to provide for the correct coordinate relations between the formations on the far side of the Moon. Also, a reliable connection between the coordinate network and the photographs make it possible to further determine the selenographic coordinates of the AIS during photographing.

In order to satisfy the requirements indicated above, the moments of beginning and termination of photographing were so chosen that the AIS would be situated close to the line joining the Sun and Moon during this time. The Moon had to be visible to the AIS as an almost completely illuminated disc. Besides the far side of the Moon, this disc would include the western region of the visible hemisphere, which contains Mare Crisium, Mare Undarum, Mare Spumans, Mare Humboldtianum, Mare Marginus, Mare Smythii, Mare Australe, the craters Endymion, Neper, Condorcet, Petavius, etc.

The conditions of illumination of the lunar disc during the photographing are analogous to those prevailing during near-full-moon phase for an observer on the Earth. The objective axes of the AIS camera almost coincided with the direction of the Sun's rays, which illuminate the lunar surface and for this reason the surface shadows become invisible and the contrasts between details become minimal.

These last situations were taken into account in choosing the photographic film and in deciding on the conditions of transmission of images from the AIS to Earth. A specially prepared photographic film, 35mm wide, which can sustain processing at high temperatures, was used. This automatic processing, including simultaneous development and fixing with subsequent washing and drying of the film, was carried out on the AIS by a special miniature device which made possible the normal sequence of the indicated processes under the conditions of weightlessness. Likewise, the processing made possible the small dependence of the negative's parameters on temperature. Photographing was done using both objectives simultaneously so that details obtained in the large-scale photographs could be identified in the small-scale photographs which included the entire lunar disc, since the orientation of the camera for any two shots would be the same.

Exposures, with automatically changing frames, were begun at command on 7 October 1959 at 6 hours, 30 minutes, Moscow Standard Time at a distance of 65,200 km from the center of the Moon and were terminated on 7 October 1959 at 7 hours, 10 minutes at a distance of 68,400 km. Thus, the diameter of the image of the lunar disc was about 10 mm on the small-scale photographs, and about 25mm on the large-scale ones.

In transmitting the photographs of the Moon to the Earth, the negative images of the film were transformed into electric signals by shining a light ray of constant brightness, produced by an electron-ray tube, through the film.

The ray moved evenly and slowly across the film and upon reaching the edge, would quickly return to the original position. The light ray's motion produced a striped developing. Development of the entire frame resulted from the slow and even movement of the film itself.

Having passed through the film, the light ray fell on a photo-electric amplifier, at the output of which was produced an electric signal having an intensity proportional to the change of transparency of the negative along the line of development.

After amplification, the image signal proceeded to a modulator, which changed the parameters of the high-frequency oscillations emitted into space, to correspond with the change of the image signal. The form of modulation was so chosen that the influence of disturbances in the line of communication between the transmitter and Earth on the quality of the image would be decreased to a minimum.

The image signals received by the Earth apparatus were recorded before demodulation by a magnetic recording device, and after demodulation by photo-recorders and various apparatus that could be visually controlled. The intensities of these signals depended on the darkness of the corresponding portion of the negative images of the Moon, which were transmitted by the AIS. Thus, basically, these negatives, obtained by the AIS and transmitted to Earth by means of radio technique, served as the original material for studying the far side of the Moon.



A photographic film that is sensitive to light, was situated in front of the screen of the electron-ray tube in the photo-recorders and was developed sideways and length-wise in a way analogous to that occurring on board the AIS.

The brightness of the beam of the electron-ray tube changed with the intensity of the received image signal and as a result the Moon's image was elementally reproduced on the film.

Besides this, such electron-ray tubes were used as kept the image on the screen for an extended period of time. Groups of the apparatus listed, carrying out parallel operations in specially selected regimes, received a complex of secondary negatives from each primary negative obtained on board the AIS.

The photographs obtained from the magnetic recordings served as important material in the scientific analysis. These photographs could be reproduced many times with different regimes of demodulation and registering apparatus, which made it possible to filter out a significant portion of disturbances in the line of transmission and to obtain essential auxiliary material along with the basic photographs.

Naturally, this work could be successfully carried out only if the magnetic recording apparatus themselves introduced minimum amounts of distortion. The speed with which the magnetic tape was made to move was so stabilized that its motion resulted in not more than 0.1 part of an element of distortion of the image element. In order to decrease distortions introduced by the apparatus,

the image signals were recorded on the magnetic tape in frequency-modulated form.

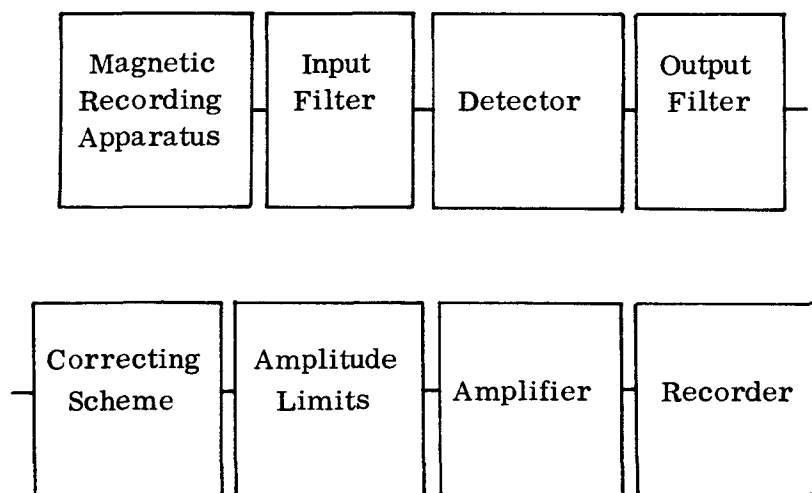


FIGURE 1

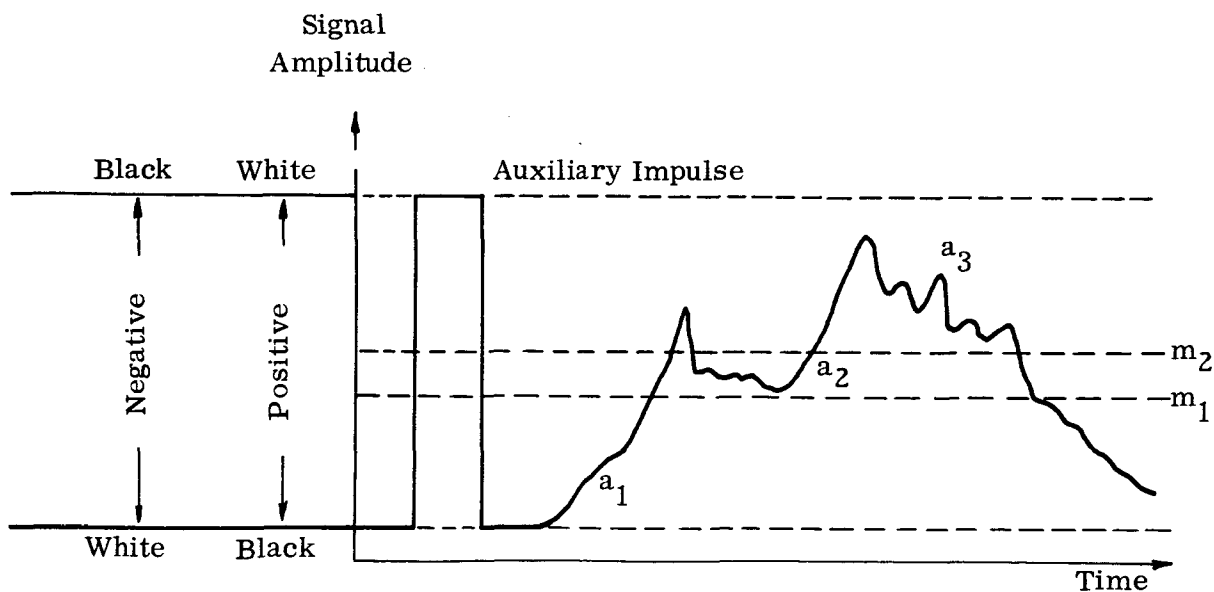


FIGURE 2

The block scheme of the apparatus used for obtaining photographs from the magnetic recordings is presented in Figure 1. The recorders used in this scheme made it possible to obtain negative or positive photographs directly on a film or on large-size photographic paper. The form of a video-signal at the input of a recording apparatus for one line of development is shown in Figure 2.

An auxiliary impulse, whose amplitude was kept constant and corresponding to the level of a white signal on the positive (black signal on the negative) was transmitted simultaneously with the image signal at the beginning of each line. The level of a black signal on the positive (white signal on the negative) was in fact determined by the fog in the film and characterized the minimum amplitude of the signal. The two indicated levels provided reference points for the sensitometric measurements and made it possible to evaluate the relative darkness of the negative and the contrast of its details.

On the basis of all these data, the optimum bands of the input and output filters, amplification coefficient of the video-signal amplifier, and parameters of the correction scheme were chosen in the apparatus complex (Figure 1.)

However, in spite of the measures taken, we did not succeed in eliminating all disturbances. Some of the frames, transmitted over the longest distances, were received heavily veiled by disturbance bands due to the small ratio of signal-to-noise at these distances. Periodic horizontal noise bands, caused by the oscillation of signal intensity due to the rotation of the AIS, are noticeable on

all the photographs. These oscillations of the signal level are caused by a break in the beam pattern of the station's antenna.

So-called integral photographs (see photographs 1, 2, 26, 27 and 28) were obtained in this way. In some exposures the negatives on board the space station came out with increased or decreased general darkness. When the negatives were darker the number of details of the lunar surface that could be discerned directly from the photographs received on Earth was greatly reduced.

Contact positives of the negatives received by the photo-recorders were used for studying the far side of the Moon. Every primary negative received on board the AIS and transmitted to Earth was represented by a number of positives from the secondary negatives recorded by several photo-recorders working in different regimes. Double negatives of all secondary negatives were also used. Both positives and negatives were printed on 35 mm film.

The diameters of the large-scale and small-scale images of the lunar disc, obtained by the photo-recorders on Earth, were equal to 25 and 10 mm, respectively.

Besides these indicated materials, positives on photographic paper and on photographic film, which were prepared by cameras that reproduced the image from the AIS signals recorded on magnetic tape, were used. The diameters of the Moon's image on these positives were about 100 mm for the small-scale photographs and about 250 mm for the large-scale ones. After this, many repeated

reproductions of all frames were made in specially arranged operating regimes of the apparatus, (i.e., so-called photometric cross sections were obtained) which significantly increased the deciphering possibilities. About 200 reproductions of all frames were actually used in this work.

Disturbances, due to radio-engineering reasons, as well as defects related to the emulsion layer of the negatives on board the AIS, were present to a greater or lesser degree on all negatives and positives without exception.

Radio disturbances in the form of bands, consisting of dots of various darknesses, are directed along the line of linear development across the film. The frequency and darkness of these bands are different for different frames. These defects in the images, that are not related to the conditions of radio transmission, led to the formation of bands of varying darknesses, which coincided with the direction of the frame's development. The bands on the primary negatives, which were exposed normally or somewhat insufficiently, for example frames 29 and 26 (see photographs 26 and 27 in this Atlas), are especially interesting. Besides this, there were defects in the form of dark spots (for example, frame 28) and bands (frame 26) in some of the frames due to damaged portions of the emulsion layer.

A significant number of frames recorded by the apparatus for recording television images on a photographic film were noticeably elliptical, apparently due to the loss of synchronization between the mechanisms on board

the station and on Earth. This ellipticity does not depend on the fact that the terminator line passes near the Moon's north pole, and by this causes a deviation from exact circularity of the edge of the lunar disc in the frames.

The characteristic of the geometric distortions, occurring in the transformation of signals recorded on the magnetic tape into photographic images, was obtained by comparing the positions of the so-called reference points. Appropriate radio disturbance points situated outside of the images and clearly reproduced in all the photometric cross sections were used as reference points.

If the images were reproduced without distortion, the reference points recorded at the beginning and end of any crosswise line of development would have to coincide upon juxtaposition of negatives of various photometric cross sections obtained from the magnetic recording of one primary negative. Moreover, the corresponding reference points situated in lines of crosswise development at the beginning and end of a frame would also have to coincide. Actually, geometric distortions occurred in both crosswise and lengthwise development. Measurements of corresponding distances between reference points on a large number of photometric sections showed that the distortions resulted in an average separation of 0.2 mm between reference points in the crosswise direction and of 0.6 mm in the lengthwise direction when the images were 10 - 25 cm in diameter.

Juxtaposition of the images of the lunar surface's details depicted in the different photographs shows that the AIS was rotating during the time of

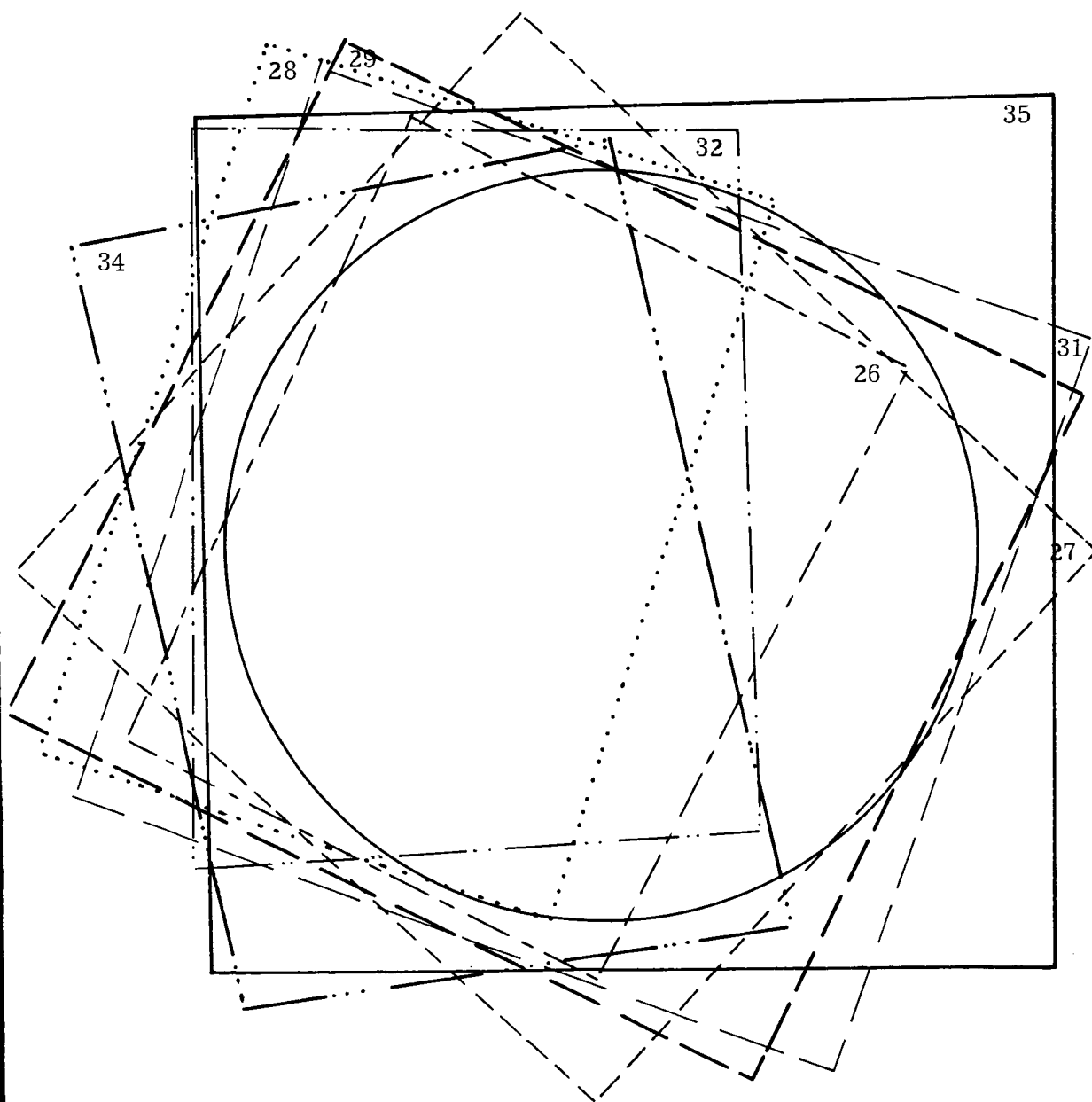


FIGURE 3

photographing. By comparing the direction of lines in the various frames and knowing the time interval between the moments of exposure of these frames, the speed of rotation of the AIS can be determined. As a result of rotation of the camera, a significant portion of what the long-focal-length objective photographed of the far side of the moon was obtained in the large scale photographs. The pattern of overlapping of various frames is shown in Figure 3 below. The position of the Moon's image with respect to the edges of the frames shows that the camera's axis was tilted at an angle of about  $0.5 - 0.7^{\circ}$  from the AIS-Moon line.

This inclination changes somewhat during the time of photographing. The errors, which this could introduce in determination of the coordinates of formations deciphered from the photographs are not large and were not greater than the errors introduced by the process of image transmission.

#### The Methods of Increasing the Informative Properties of the Photographs Transmitted by the AIS

The conditions of illumination of the lunar surface during the time of photographing, as indicated above, when the contrasts of details becomes minimal, made it quite difficult to recognize separate formations and their peculiarities and to pick them out from among the disturbances. Direct examination of the prints made it possible to discover a small number of the more distinct and characteristic details.



Various methods were used to delineate the more indistinct details and to establish their existence. One of these methods was that of superposition of different frames. From several strictly coincident frames obtained under identical conditions, the actual details in them stand out while the random disturbances cancel out. Several types of superposing were used; simultaneous projection of several frames on a screen; projection of a positive on a positive print of another frame; obtaining "combination" prints from several negatives. Map-schemes containing several tens of details were compiled by this method in Pulkova and Kharkov.

Most effective for delineating a large number of details was a special method of photometric cross sections used by the Moscow group, which was worked out for this purpose and aided in raising the information properties of the available photographs of the far side of the Moon. Besides this the method of photographic masking was partly used in Moscow.

The Method of Photographic Masking. When a detail having a wide variety of darkness is present in a negative, it cannot be successfully transmitted in a single printing on photographic paper because of its small photographic latitude. There was a wide range of darknesses among various parts in negatives of the far side of the Moon. Thus for example, on some normally exposed frames regions of the Soviet Range and Giordano Bruno's crater differed sharply in darkness from regions in Mare Crisium, Mare Spumans, Mare Undarum and Mare Foecunditatis.

At the same time the intervals between darknesses of the separate details in these zones were very small as a result of the indicated conditions of illumination.

In order to decrease the great differences between the darknesses of the various parts of the negatives, the method of photographic masking which consists of the following could be used. A blurred positive (mask) is made from the negative to be analyzed. The image is blurred in the course of developing the mask by keeping its emulsion layer at a distance of several millimeters from the emulsion layer of the negative. A positive so treated develops before the required range of darknesses is attained, the limits of which are arrived at by trial and error. The obtained positive is then put together with the negative, with the positive being placed on the side of the light source. Obviously, photographic masking requires that the mask coincide exactly with the negative. Because of the presence of disturbance bands on the photographs of the back side of the Moon, the mask and negative had to be made to coincide that much more exactly than ordinary photographs and as a result, the method's effectiveness was decreased. The prints obtained on contrast photographic paper with the use of a mask increased the boundary contrasts between some details and made it possible to clarify the configurations of a number of formations situated on the far side of the Moon. However the increase of contrast obtained in this way was clearly insufficient for showing up the greater number of formations in the photographs.

The Method of Photometric Cross Sections. The most fruitful method turned out to be that of photometric cross sections which was widely used for deciphering the photographs of the far side of the Moon. It consists of multiple amplification by radio technique methods of the contrasts between details in the negative - not all of them at the same time but one by one depending on their photometric properties. This method was successfully realized due to the active help of radio operators with an apparatus that reproduced the negative images transmitted by the AIS from the records on magnetic tape. The parameters of the apparatus make it possible to record a known range of darknesses on the negative, which corresponds to a certain interval of brightness of the object. If the intensity interval of the image signals recorded by the apparatus is less than is permitted by its parameters, the intensities in the indicated interval can be correspondingly amplified. The smaller the intensity interval in the image requiring transformation by the apparatus chosen, the larger the amplification coefficient that can be used. The size of the interval was established by an amplitude limitation depending on the chosen photometric cross section. The maximum amplification coefficient permitted by the apparatus we used, equalled 100. We shall clarify this by an example. Let the curve  $a_1 a_2 a_3$  in Figure 2 show the distribution of amplitudes along a line of the image transmitted by the AIS. The intensity  $\ell_0$  of the auxiliary impulse, having a constant amplitude corresponding to the level of a positive white signal, is taken as 100%. If we take two levels on the curve of amplitude distribution along a

positive image line corresponding to the lines  $m_1$  and  $m_2$ , and record only the interval within these lines, then all of the parts of the curve representing amplitudes of image signals that lie above  $m_2$ , will be recorded as white and all parts representing amplitudes below  $m_1$  will be recorded as black. After such an operation with all of the lines forming the positive images, a photometric cross section of the image was obtained. Moreover, only the contrasts of darknesses whose image signal amplitudes were situated between  $m_1$  and  $m_2$  were amplified a known number of times. All of the zones of a negative transmitted by signals whose amplitudes are situated above the  $m_2$  level or below the  $m_1$  level should come out white or black. The size of the amplification coefficient was determined by the interval of intensities or their corresponding darknesses, which was recorded in the image. The interval  $m_2 - m_1 = \Delta m$  can be changed, thus changing the amplification coefficient. Besides this, it is possible to make "low" or "high" photometric cross sections depending on whether low or high intensities are included in the interval  $\Delta m$ . In other words, depending on where the interval limited by  $m_1$  and  $m_2$  is imposed in relation to the curve of distribution of amplitudes along a line. If the interval  $\Delta m$  becomes so wide that it includes the curves of amplitude distribution along the brightest and darkest image lines, the resulting photograph shall be called "integral". Different photometric cross sections were used depending on which zone was to be deciphered. For portions having little darknesses, for example the portion  $a_1$  in Figure 2, it is necessary to lower the height  $I$  of the photometric cross section enough so that the section

$a_1$  is entirely included in the interval  $\Delta m$ . The height of the amplitude of the center of the interval  $m_2 - m_1$ , expressed in % of  $I_0$ , is called the height of the photometric cross section  $I$ . If very dark portions (white on the positives) are to be analyzed, a high photometric cross section is made, for example as for  $a_3$  in Figure 2, etc.

The photometric cross section method turned out to be fruitful not only for deciphering completely unknown formations on the far side of the Moon, but also for identifying formations situated on the western edge of the visible lunar disc. The identification of some 100 details that have already been studied, is a criterion of reliability in a certain sense, of the newly revealed formations of the far side of the Moon.

#### Photometric Cross Sections of Photographs of the Far Side of the Moon

Photometric cross sections were obtained from all frames after all the materials had been studied in order to analyze the formations of the far side of the Moon. The quantities  $\Delta m$  and  $I$  for each cross section of a given frame were chosen by trial and error depending on the darkness of the zone to be examined. It was frequently sufficient, in analyzing some portion, to obtain a photometric cross section not of the entire frame, but simply of the section to be studied. This took up less time and for this reason it was possible to make a larger number of photometric cross sections with a gradual change of the quantity  $I$ . As an example, we shall examine the photometric cross section of the large-scale frame No. 26.

# THE UNIVERSITY OF MICHIGAN

2914-1-T

The photometric cross section 26 - 2 (see photograph 3) is the integral print. The quantity  $I = 53\%$  and the width of the interval  $\Delta m = 71\%$ . A very large number of details are noticeable on this frame which are easily distinguished near Mare Crisium, Mare Marginus, Mare Smythii and objects more westward than these (the westerly direction is the same as that in which the longitudes increase). Many separate dark formations apparently of the type of crater seas or cirques are noticeable in the Mare Australe region. Many formations that are visible from the Earth in the peripheral zone, such as Endymion, Mare Humboldtianum, Gauss, Hanno, Plutarch, etc., are also recognizable. However, the region at  $+5^{\circ}$  latitude and  $120^{\circ}$  longitude poorly relates particularities of the lunar relief. The same can be said with regard to the regions situated to the northwest of Mare Humboldtianum, near Giordano Bruno, to the southwest and south of Mare Australe, etc. The boundaries of Mare Marginus and Mare Smythii are not sufficiently clear in the examined frame. The difference in brightness between Neper (in which the central hill is very noticeable) and Mare Marginus is not noticeable, etc.

The next photometric cross section is 26 - 3 (see photograph 4). Here the quantity  $I$ , which represents the "height" of the cross section, remains the same ( $53\%$ ) although the interval  $\Delta m$  is now taken at  $63\%$  (instead of  $71\%$ ). This photograph is also an "integral" one but its appearance is somewhat changed. Some of the details near the Soviet Range are lost, but the discernibility of

the northern part of the Mare Smythii and adjacent formations is increased. The details at  $\beta = -25^{\circ}$  and  $\lambda = +70^{\circ}$  have become a little more visible. The regions of Mare Marginus and Mare Humboldtianum remain almost the same for the better, while visibility around Endymion is worse.

The photometric cross section 26 - 1 (photograph 5) was made with a higher I equal to 60% and a smaller darkness interval  $\Delta m = 55\%$ . The appearance of the photograph changed considerably this time. It turned out that a significant portion of the image was darker than the upper limit of the interval of recorded darknesses and thus became "white". It was enough to lower the interval  $m_2 - m_1 = \Delta m$  but 8% in comparison with the cross section 26 - 2, when the Soviet Range region, the entire region northwest of Giordano Bruno and west of the Mare Humboldtianum became "white". The difference between the brightnesses of the formations north of Mare Marginus was revealed more clearly - some of them turned out to be above  $m_2$  and became "white" (differences of 8 - 10% between the intensities of the recording signals were not so sharply revealed in the photometric cross section photograph 26 - 2). The formations situated on the western boundary of Mare Humboldtianum, to the north and northwest of Mare Marginus became more clearly defined. The southwestern and southern boundaries of Mare Smythii were visible a little better. Many formations between Mare Smythii and Mare Australe which before were a little lighter than the general background, and now became "white", became clearer. The contour of the Mare Australe became a little better, many details situated in it became

lighter than the floors of Mare Smythii or Mare Marginus which are seen as very dark formations on the photograph.

The photometric cross section 26 - 4 (photograph 6) was obtained for the values  $I = 35\%$  and  $\Delta m = 71\%$ . The large role played by the "height" of the cross section becomes immediately evident if we compare this photograph with 26 - 2 ( $I = 53\%$ ,  $\Delta m = 71\%$ ). The clarity of most of the details in photograph 26 - 4 is sharply reduced but it reveals that the northwestern part of Mare Smythii is darkest. It is noticeable that the bottom of Neper is lighter than the central part of Mare Marginus. The boundary of the darkest northeastern part of Mare Humboldtianum is delineated. The boundaries of formations on the peripheral eastern zone became more clear.

The photometric cross section 26 - 9 (photograph 7) is the highest: The photograph is obtained with  $I = 70\%$  and  $\Delta m = 10\%$ . The amplification coefficient was close to 40 in this case. Thus the contrasting differences between the "gray" details reproduced by signals having intensities of 65 to 75% of the intensity of the mentioned auxiliary impulse, were amplified 40 times. As is evident from the photograph, the great majority of formations were recorded by signals of less than 65% intensities and for this reason, they naturally came out "black". As a result the following formations disappeared against the "black" background: Mare Humboldtianum, Mare Crisium, Mare Spumans, Mare Smythii, Mare Australe, the Lomonosov, Joliot-Curie, Edison, Maxwell craters and others.



An area in the  $+60^{\circ}$  latitude region and separate parts of the Soviet Range turned out to be recorded as white without amplification of the contrasting differences of details.

The reproduction regime of this photometric cross section was so chosen that it facilitated the analysis of areas near Giordano Bruno, in the Soviet Range region and areas close to these in intensity. New details were discovered in the photograph. The boundaries of the circular formations of Giordano Bruno were noted and the non-uniformity of its internal structure was revealed. A white spot, apparently a raised portion is noticeable to the southwest of this formation. The bright white spot surrounding Giordano Bruno in the integral photograph and in previous cross sections, fell apart into separate details. Only separate details of the light area 701 at the north were recorded on the "white" level ( $\beta = +63^{\circ}$ ,  $\lambda = +100^{\circ}$ , see Map of Far Side of the Moon).

On all the other photographs, this region appeared as a plain white spot with practically invisible details. Beside it ( $\beta = +57^{\circ}$ ,  $\lambda = +102^{\circ}$ ) an almost round formation 666, somewhat resembling Mare Humboldtianum in details appeared relatively clearly. This detail was unnoticeable in the other photometric cross sections and in the integral photographs. The uneven internal structure of detail 666 was revealed. A light, round formation is easily noticeable against its dark background in its eastern part. Since the value of  $\Delta m = 10\%$  during recording of the photometric cross section 26 - 9, those details situated near one another and

appearing "gray" on photographs (neither "white" nor "black") are differentiated with respect to the appropriate amplitudes by not more than 10%. Thus the light spot situated in the east of formation 666 almost coincides, with respect to intensity, to the portion surrounding Giordano Bruno and to some parts in the Soviet Range region. This cross section well reveals formation 687 ( $\beta = +53^{\circ}$ ,  $\lambda = +117^{\circ}$ ) which is not noticeable in previous photographs and which apparently resembles 666. Small light spots are noticeable in the dark bottom of this crater-like formation. Separate details which differ in brightness more than by 10% are likewise revealed in the Soviet Range region.

The next photometric cross section 26 - 10 (photograph 8 was made with  $I = 60\%$  and  $\Delta m = 10\%$  (i.e., with amplification equal to that of the foregoing cross section). In this photograph quite large regions went over into the "white" sphere, although from 9 and 26 - 10 differ only by 10% with respect to  $I$ . A trace of a ray, going from Giordano Bruno to the Soviet Range and crossing through about the center of the circular formations 640 ( $\beta = +28^{\circ}$ ,  $\lambda = 108^{\circ}$ ) and 638 ( $\beta = +25^{\circ}$ ,  $\lambda = 109^{\circ}$ ) begins to be noticeable in the latter photograph. A significant number of details in the region bounded by the coordinates  $\beta = +10^{\circ} \div +30^{\circ}$  and  $\lambda = +110^{\circ} \div 130^{\circ}$ , become noticeable in this section, while they are hardly so in others.

A number of bright light spots, part of which turned out to be recorded at the "white" level, stood out noticeably in the Soviet Range region. Formations

701, 666, 687 and others almost disappeared on the light background. The traces of a number of details in the south became clearer. The contour of Mare Australe began to be visible. A region that differs little in brightness from the region bounded by the coordinates  $\beta = +10^{\circ}$ ,  $+30^{\circ}$  and  $\lambda = +110$ ,  $+130^{\circ}$  is adjacent to this Mare. Mare Marginus, Mare Crisium, Mare Smythii and a number of other details continue to be recorded as black. The contours of Mare Humboldtianum, Tsiolkovskii and others became barely noticeable.

The photometric cross section 26 - 11 (photograph 9) was made with an amplification coefficient of about 40 and a value of  $I = 50\%$ . Lowering the height of the cross section by another  $10\%$  again greatly changed the appearance of the photograph. Some of the previously visible details disappeared and the visibility of others improved. The ray going from Giordano Bruno to the Soviet Range showed up sharply. The contours of the Joliot-Curie, Edison, Lomonosov and Maxwell craters showed up more clearly. Sections near Mare Australe that were reproduced on the "gray" level by signals differing not more than  $10\%$  in intensity became differentiated. Areas within Mare Australe that differed less than  $10\%$  in intensity from areas to the north and east of it, became noticeable, and so forth.

Even a greater portion of the surface turned out "white" in the photometric cross sections 26 - 12 and 26 - 14 (photographs 10 and 11), which were likewise obtained with an amplification coefficient of about 40 and with heights of 40 and

35, respectively. A comparison of the photographs shows that there is a brighter detail (noticeable in 26 - 12) among the structural particularities of the Joliot-Curie (i.e., it has an amplitude about 10% greater than do the details revealed in 26 - 14).

A round dark spot, situated in the southeastern part of Joliot-Curie is visible in 26 - 14 and is apparently also a crater. The differences in intensity of regions adjacent to Mare Marginus, Mare Smythii, of many details within Mare Australe, etc., can be evaluated.

Besides the photometric cross sections of frame No. 26 that are listed here, a significant number were prepared from separate parts of the frame, which needed analysis of very fine differences of intensity. Most of them were prepared with an amplification coefficient of about 100 and with gradual transition with respect to height. Thus, for example (photographs 12 through 22)

$I = 75\%$ and $\Delta m = 4\%$	for the intensity of 26 - 1d
$I = 76\%$ and $\Delta m = 4\%$	for the intensity of 26 - 2d
$I = 77\%$ and $\Delta m = 4\%$	for the intensity of 26 - 3d
$I = 78\%$ and $\Delta m = 4\%$	for the intensity of 26 - 4d
$I = 79\%$ and $\Delta m = 4\%$	for the intensity of 26 - 5d
$I = 45\%$ and $\Delta m = 4\%$	for the intensity of 26 - 6d
$I = 46\%$ and $\Delta m = 4\%$	for the intensity of 26 - 7d
$I = 47\%$ and $\Delta m = 4\%$	for the intensity of 26 - 8d
$I = 48\%$ and $\Delta m = 4\%$	for the intensity of 26 - 9d
$I = 52\%$ and $\Delta m = 4\%$	for the intensity of 26 - 10d
$I = 58\%$ and $\Delta m = 4\%$	for the intensity of 26 - 13, etc.

The following parts of frame 32 are given in photographs 23, 24 and 25 in the same order

$I = 15\%$ , $\Delta m = 70\%$	for the intensity of 32 - 5d
$I = 20\%$ , $\Delta m = 70\%$	for the intensity of 32 - 6d
$I = 22\%$ , $\Delta m = 70\%$	for the intensity of 32 - 7d

The terminator line in these photographs passes through the upper part of the picture. A group of craters is clearly noticeable in the upper righthand corner. The proximity of the terminator emphasizes the relief of the formations. The appearance of the craters is close to that obtained in photographs made from the Earth.

Integral photographs of frames 29 - 2, 31 - 2, 26 - 0, 28 - 1 and 28 - 3 are shown in photographs 1, 2, 26, 27 and 28 as examples of the photos obtained by the AIS.

Some 200 photometric cross sections whose regimes were chosen by trial and error, were used in the process of work on the photographs of the far side of the Moon. The parameters of some photometric cross sections are presented in Table 1.

TABLE 1

LIST OF PHOTOMETRIC CROSS SECTIONS ACCORDING TO FRAMES

Frame	Photometric Cross Section	I	$m_2 - m_1 = \Delta m$	Frame	Photometric Cross Section	I	$m_2 - m_1 = \Delta m$
26	Primary			27	Auxiliary		
	1	60	55		1	40	15
	2	53	71		2	40	10
	3	53	63		3	40	3.5
	4	35	71		4	42.5	15
	9	70	10		5	42.5	3.5
	10	60	10		6	45	15
	11	50	10		7	45	10
	12	40	10		8	45	3.5
26	Auxiliary				9	47.5	15
	10	52	4		10	47.5	3.5
	11	54	4		11	48	3.5
	12	56	4		12	49	3.5
	13	58	4		13	50	3.5
	14	44	4		14	51	3.5
	15	46	4		15	52	3.5
	16	48	4		16	53	3.5
	17	50	4	28	Primary		
27	Primary				1	64	60
	1	40	60		3	70	60
	2	40	30		5	70	60
	3	40	15		6	72	50
	4	40	8		18	70	10
	5	30	30		19	65	10
	6	30	15		20	60	10
	7	30	8		21	55	10
	8	20	15		23	40	30
	9	20	8				
	10	10	15				

THE UNIVERSITY OF MICHIGAN

2914-1-T

Frame	Photometric Cross Section	I	$m_2 - m_1 =$ $\Delta m$	Frame	Photometric Cross Section	I	$m_2 - m_1 =$ $\Delta m$
29	Primary			31	Auxiliary		
	1	40	63		8	18	5
	2	55	63		9	22	5
	3	48	55		10	27	5
	4	63	63	32	Auxiliary		
	5	35	8		1	20	25
	6	41	8		2	20	20
	7	47	8		3	20	16
	8	53	8		4	10	70
	9	60	8		5	15	70
	10	67	8		6	20	70
	11	74	8		7	22	70
30	Primary				8	10	3.7
	1	44	3.5		9	12	3.7
	2	48	3.5		10	14	3.7
	3	48	3.5		11	16	3.7
	4	48	6		12	18	3.7
31	Primary				13	20	3.7
	1	46.6	83	33	Primary		
	2	56.6	60		1	67	50
	3	66.6	60		2	60	4
	4	73.3	60		3	65	4
	5	75	45		4	71	4
	6	40	10		5	78	4
	7	50	10	34	Primary		
	8	56.6	10		1	50	50
	9	60	10		2	45	50
	10	61.6	10		3	55	50
	12	63.3	10		4	40	5
	13	66.6	10		5	43	5
31	Auxiliary				6	45	5
	1	15	50		7	47	5
	2	20	50		8	48	5
	3	27	50	35	Primary		
	4	4	5		1	23	50
	5	8	5		2	33	50
	6	10	5		3	38	50
	7	13	5		4	30	50

THE UNIVERSITY OF MICHIGAN

2914-1-T

Frame	Photometric Cross Section	I	$m_2 - m_1 =$ $\Delta m$	Frame	Photometric Cross Section	I	$m_2 - m_1 =$ $\Delta m$
35	Primary			36	Second Transmission		
	5	22	8		1	53	28
	6	25	5		2	63	28
	7	28	5		3	50	5
	8	33	5		4	53	5
	9	35	5		5	55	5
	10	38	5		6	57	5
36	First Transmission				7	60	5
	1	58	70	38	Primary		
	2	63	70		1	70	50
	3	70	70		2	76	50
	4	70	70		3	86	50
	5	18	9		4	82	50
	6	23	9		5	88	6.7
	7	28	9		6	80	4.0
	8	33	9		7	76	6.7
	9	38	9		8	70	6.7



## Analysis of the Material

As already indicated, photographing of the far side of the Moon continued for 40 minutes during which time the selenographic coordinates of the AIS changed but  $0.4^{\circ}$  in latitude and  $0.5^{\circ}$  in longitude. For this reason it was decided to construct only one coordinate network and reduce all photos to the scale of this network. The resulting errors in the coordinates of the lunar formations are much less than the errors caused by geometric distortions of the photos.

A scale of 1:10,000,000 was chosen for the map of the far side of the Moon, and all the photos were reduced to approximately the same scale. A circle, 35 cm in diameter and somewhat cut off at the north due to the Moon's phase, served as the basis for transforming the small-scale photos.

The edge of the lunar disc did not appear on all the photometric cross sections of every frame. In order to convert these sections correctly, reference points were used. Either the integral photograph or the lowest photometric cross section in which the outline of the lunar disc was clearest was first established in the photographic converter. By changing the projection scale and the inclination of the screen we sought to make the edge of the disc fit into the mapped circumference. The reference points were transferred at the same time. In transforming all of the subsequent copies of a given frame, the clearly recognizable portions of the lunar disc and the transferred points served as reference points. We succeeded in somewhat decreasing the geometric distortions of the photos in this way.

The southern and southeastern portions of the lunar disc and clearly visible large objects (Mare Crisium, Mare Humboldtianum, Mare Marginus, Mare Smythii, Lomonosov, the Moscow Sea, Tsiolkovskii) that were transferred from the small-scale photos were used as reference points in transforming the large-scale photos. Transformation began in the same way as with the small-scale photos - from a photometric cross section in which the edge of the lunar disc and some of the above-mentioned objects were most clearly shown.

The image of the disc's edge and the reference objects were used partly in transforming the subsequent photos, but the disturbance spots were the main reference points, and these were transferred to the initial negative when the first print was transformed.

In the process of transformation the small-scale photographs were enlarged about 3.5 times and the large-scale ones about 1.4 times. Thus the total enlargement of the transformed photos over the originals was about 35 and 14. Examples of transformed photos of frames 29 (small-scale) and 26 (large-scale) are given in photographs 29 and 30\*. The appearance and quality of the images of quite small objects is evidence not only of the good quality of the photographic emulsion used for obtaining the original negatives and of the development process, but also of the high resolving power attained in the television transmission of the images.

---

\* For technical reasons, the image of the Moon in photograph 29 is magnified about 28 times.

Analysis of the formations of the far side of the Moon was carried out from the transformed photographs. In doubtful cases, images of the respective objects were studied from the photographic films obtained from the magnetic recordings simultaneously with the prints on photographic paper.

First, the discernible details in prints of all of the photometric cross sections of each frame were outlined on those prints where they appeared most clearly. Then the reference points, all of the outlined objects and the edge of the lunar disc were transferred to tracing paper from the first print. The reference points on the tracing paper were matched up with those on the other photographs in transferring outlined details from the latter to the former. In this way all of the formations discerned on the photos of all the photometric cross sections were collected on one tracing paper. These composite tracings, compiled for all frames were superimposed one on another. Alignment, was effected according to the more clearly delineated objects which appeared on all the frames (the Tsiolkovskii, Kurchatov, Lomonosov, Giordano Bruno, Jules Verne and Neper craters, Mare Crisium, the Moscow Sea, Mare Australe). On top of these was put a clean tracing paper onto which were transferred formations outlined on not less than two frames, the outer edge of the lunar disc and the reference points of each frame. As the objects were traced the second time they were numbered and registered in the catalogue. Three digit numbers were used to identify the formations, beginning with 101. Besides the number of the formation, the numbers of the frames in which

it was found and the numbers of photometric cross sections were included in the catalogue. A description of what was seen on the photographs was also recorded - whether the formation is light or dark - from which frames were the position, form and dimensions of the object taken. Furthermore, the object's position was transferred to the tracing paper as a rule from the frames having the least geometrical distortion, while its form and dimensions were taken from the frames in which it was most clearly delineated.

The tracings compiled in this way were corrected again in the process of which the correctness of the outline of each formation was established by checking against the photographs of the necessary photometric cross sections of the corresponding frames and against the other materials: the uncertain formations were removed and others drawn in, the outlines of the formations were made more exact, the degree of certainty was more accurately determined and the object was described. After corrections the tracing was used for further work.

All of the outlined formations are divided into three categories. Formations that are noticeable on three or more frames and are clearly delineated as well as showing all identified objects of the peripheral and libration zone are put into the first category. The position and outlines of these formations are reliably established. Formations that are noticeable on only two frames, or on many frames but not too clearly, are put into the second category. Their outlines will be made more exact from photographs of the far side of the Moon taken at other phase

angles. Those formations which had unclear outlines or were decipherable only on one frame, fall into the third category.

Besides the formations of the far side of the Moon, some 100 formations situated on the visible side in the zone between  $70^{\circ}$  -  $90^{\circ}$  western longitude were identified with objects visible on photographs taken from the Earth. Several clearly visible objects of the Moon's visible surface towards the east from the  $70^{\circ}$  meridian were likewise transferred to the tracing paper for coordinate correlation.

A coordinate network in an external perspective projection was computed and constructed according to the AIS's known selenographic coordinates and its distance from the Moon during photographing. In agreement with the material available, the formations situated on the visible side of the Moon were drawn on this network. Then the tracing paper with all of the formations discovered from the photographs was superimposed on the coordinate network in such a way that identical objects on the tracing paper and on the constructed projection coincided best. The coordinate network was then transferred to the tracing paper. The exactness of coincidence can be evaluated from the differences between the coordinates computed from the tracing paper and those determined from Wilkins' map [3]. The values of these differences are presented in Table 2.

The values of differences presented in the table are of random character and result from both the geometric distortion of the photographs and errors in identifying lunar formations on them. In drawing up the map, the position

of Endymion and of Mare Humboldtianum were taken from Wilkins' map and thus formations on the far side of the Moon that are close to these, particularly a group of craters near the north pole, were displaced.

TABLE 2

Object	Coordinates on Tracing Paper		Coordinates from Wilkins' Map		Differences	
	$\lambda$	$\beta$	$\lambda$	$\beta$	$\delta\lambda$	$\delta\beta$
Endymion	+50°	+55°	+54°	+54°	- 4°	+ 1°
Mare Humboldtianum	77	+59	78	+56	- 1	+ 3
Messala	60	+40	59	+41	+ 1	- 1
Cleomedes	54	+28	55	+27	- 1	+ 1
Condorcet	69	+12	69	+13	0	- 1
Appolonius	60	+ 6	60	+ 6	0	0
Neper	86	+ 8	84	+ 9	+ 2	- 1
Langrenus	60	- 8	60	- 8	0	0
Vendelinus	61	-17	60	-17	+ 1	0
Petavias	59	-24	61	-25	- 2	+ 1
Marinus	76	-39	76	-39	0	0
Oken	75	-45	74	-43	+ 1	- 2
Hanno	73	-54	73	-58	0	+ 4
Humboldt, W.	83	-27	82	-27	+ 1	0

TABLE 3

Object	Coordinates According to C.Sc-R.I.G.A. C., S.S.A.I.*		Coordinates According to M.A.O.**		Differences	
	$\lambda$	$\beta$	$\lambda$	$\beta$	$\delta \lambda$	$\delta \beta$
Lomonosov	+ 99 <sup>0</sup>	+27 <sup>0</sup>	+ 98 <sup>0</sup>	+28 <sup>0</sup>	+ 1 <sup>0</sup>	- 1 <sup>0</sup>
Giordano Bruno	+103	+36	+102	+38	+ 1	- 2
Kurchatov	+144	+32	+143	+32	+ 1	0
Moscow Sea	+149	+27	+150	+30	- 1	- 3
Mendeleev	+167	-02	+170	0	- 3	- 2
Jules Verne	+151	-37	+147	-36	+ 4	- 1
Tsiolkovskii	+131	-22	+128	-21	+ 3	- 1
Sklodovskaia-Curie	+102	-23	+ 98	-22	+ 4	- 1
407	+119	-22	+117	-18	+ 2	- 4
Hertz	+101	+11	+ 99	+12	+ 2	- 1
Lobachevskii	+112	+09	+111	+10	+ 1	- 1
725	+175	+85	-159	+79	+26	+ 6
726 + 729	+170	+79	-168	+76	+22	+ 3

\*C.Sc-R.I.G.A.C. - Central Scientific - Research Institute of geodesy, aerophotography and cartography. S.S.A.I. - P.K. Sternberg State Astronomical Institute.

\*\*M.A.O. - Main Astronomical Observatory of the Academy of Sciences of the USSR.

The accuracy of the coordinates determined for the formations on the far side of the Moon can also be judged from the differences between coordinates for identical objects determined independently by the Main Astronomical Observatory of the Academy of Sciences of the USSR and the C.Sc-R. I. of Geodesy, Aerophotography and Cartography together with the P. K. Sternberg Astronomical

Institute. These differences are presented in Table 3.

If we do not count objects 725 and 726 and 729 situated near the pole, the average differences are  $2^{\circ}$  in longitude and  $1.5^{\circ}$  in latitude, which means that the average error of determination of coordinates of formations on the far side of the Moon comprises about  $1.4^{\circ}$  in longitude and  $1.1^{\circ}$  in latitude.

The final map of the far side of the Moon was drawn as an equatorial orthographic projection with the central meridian at  $120^{\circ}$  west longitude. In order that the map be easily seen at a glance and at the same time be easy to read, a scale of 1:1,000,000, was chosen. Thus the diameter of the lunar hemisphere on the map was made equal to 34.76 cm. The coordinate network is drawn through every  $10^{\circ}$  in longitude and latitude. The materials used for compiling the map of the far side of the Moon were Wilkins' map for the visible side of the Moon and the tracing paper containing the formations derived from the AIS photographs and their descriptions in the respective catalogues. The following arbitrary designations are used in connection with the results of analysis: objects of the first category are outlined by a solid line; objects of the second category are outlined by a broken line, and those of the third category by a dotted line. Dark formations are shaded in. A special arbitrary symbol is used to designate light colored formations that represent a complex of smaller formations (for example the Soviet Range). The rays seen in several photos are represented by broken lines. A heavy broken line indicates the limit of visibility from the AIS



during photographing. Each of the formations deciphered from the photos is numbered the same on the tracing paper as in the catalogue. Objects which were named are so labeled along with the number.

The map of details of the lunar surface that was obtained in the described way was compared with analogous but less detailed maps and schemes obtained independently in Pulkova and Kharkov. Almost all the details discovered by the latter groups coincided with the reliable details of the map published here. Differences were noted only in the outlines of some of the formations.

A catalogue of the discovered details and an Atlas of the Far Side of the Moon are presented below. The catalogue contains the numbers of the objects by which they are identified on the map and their given names. It also contains a list of the frames and their photometric cross sections used to decipher each detail, - descriptions of what was seen on the photographs and descriptions of the separate objects and their coordinates.

All of the objects are listed in order of certainty. First are listed those of the first order of certainty. These are 252 in number. Then are listed the 190 formations of the second category and finally the 57 formations of the third category. The last require verification.

The Atlas includes integral photographs and photometric cross sections of the photographs of the far side of the Moon along with a map drawn in an equatorial orthographic projection with the central meridian at  $120^{\circ}$  and to a scale of 1:10,000,000.

The map presented here was compiled on the basis of studies of the first photographs of the far side of the Moon obtained by the Soviet AIS. Being but the first attempt it will undoubtedly be refined and filled in from new photographs which will be taken at different phases of the Moon.

## BIBLIOGRAPHY

1. The first photographs of the far side of the Moon. M. Izd. vo. AN ASSR. 1959
2. N. P. Barabashev, Y. N. Lipsky. The first results of photographing of the far side of the Moon. DAN SSSR 120: 1959. No. 5
3. Wilkins, H. P. Map of the Moon, 1958
4. Wilkins, H. P., Moore, P. The Moon. London 1955
5. Neison, E. Der Mond. Braunschweig, 1881

LEGEND FOR THE FOLLOWING FOUR PAGES



Verified formations with clear outlines.



Formations with less clear outlines.



Formations whose outlines must be verified.



Formations that are darker than the surrounding ground.



Formations that are lighter than the surrounding ground.

142

Numbers of formations in the catalogue

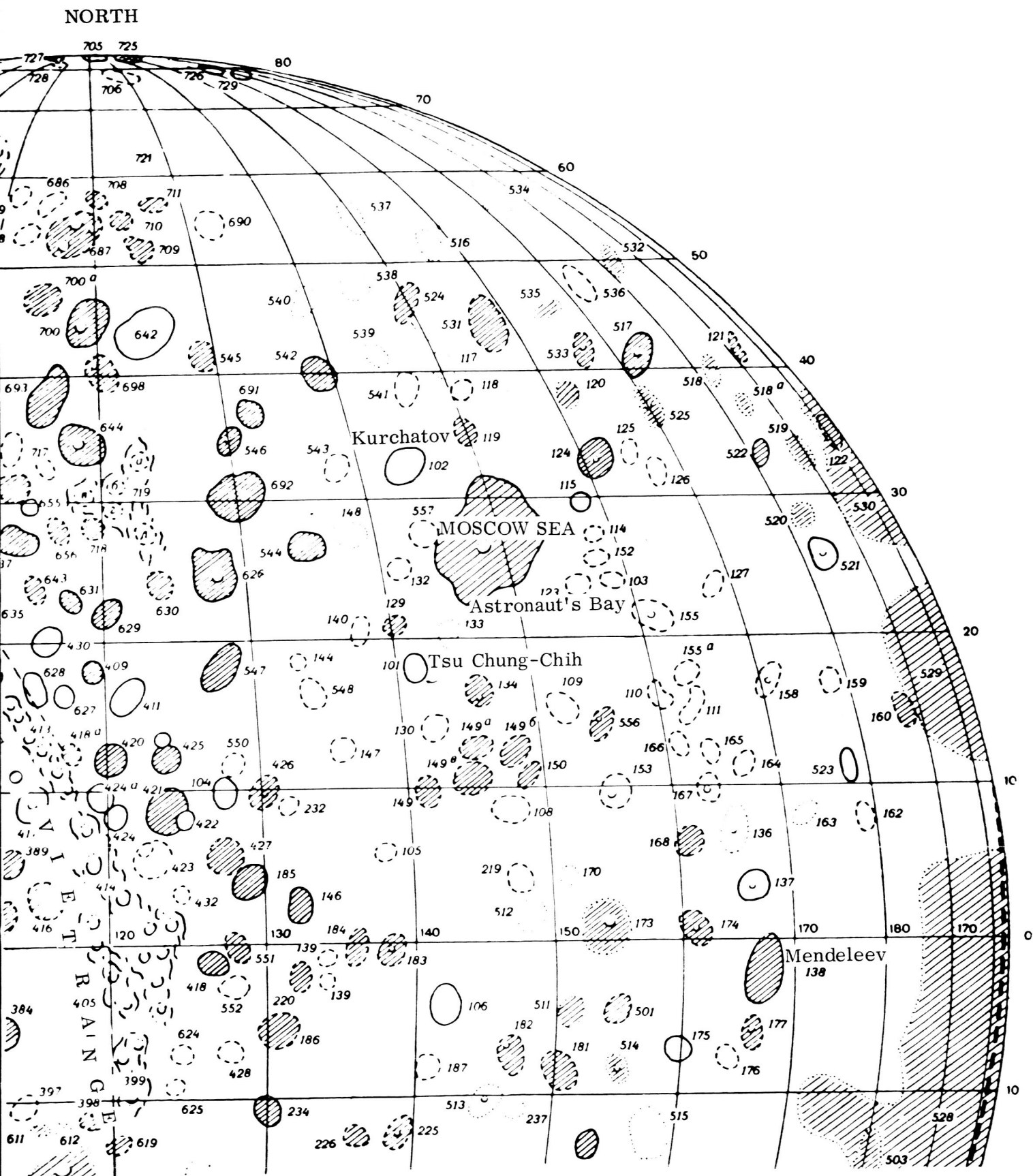


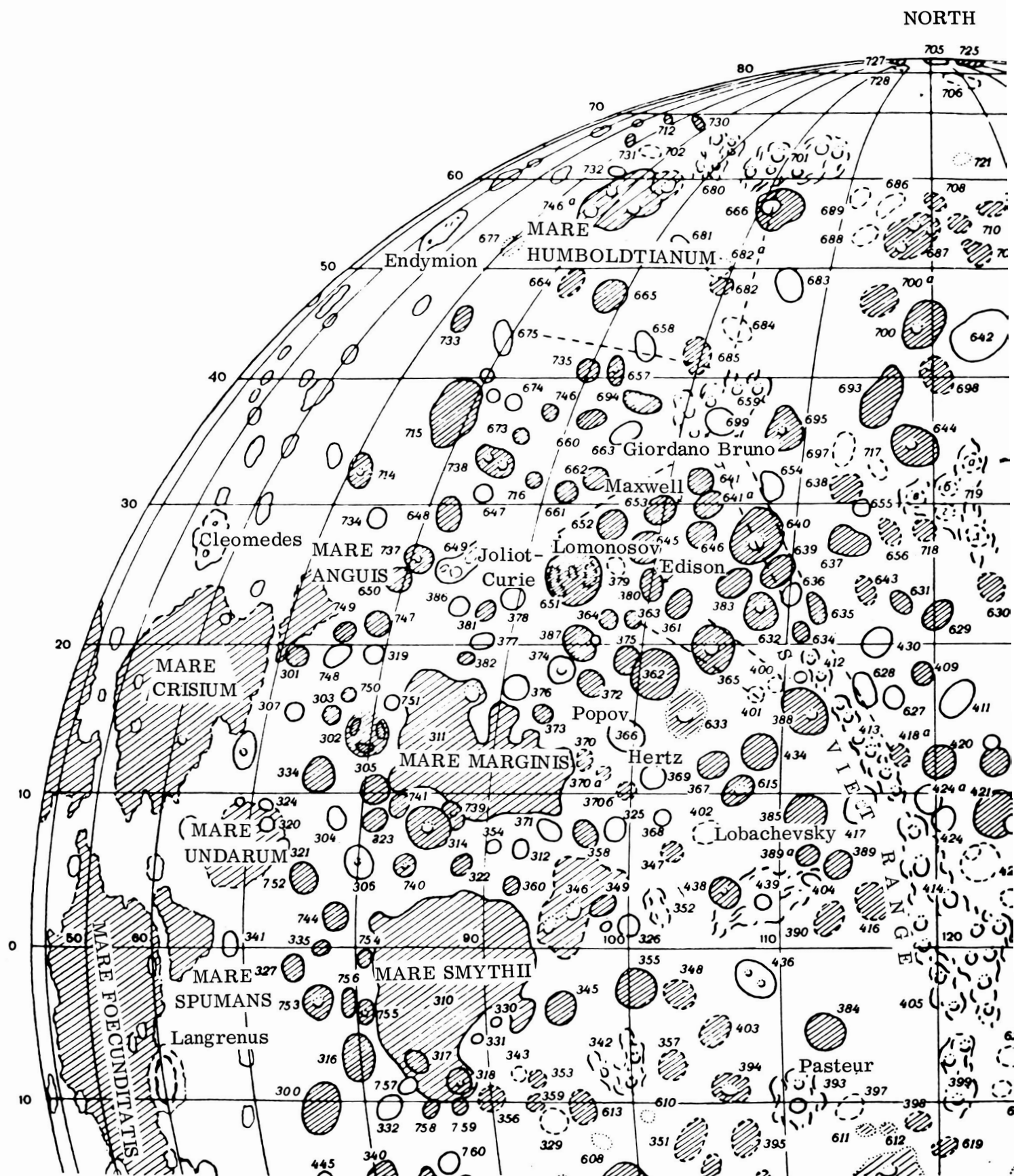
Rays



Limit of visibility

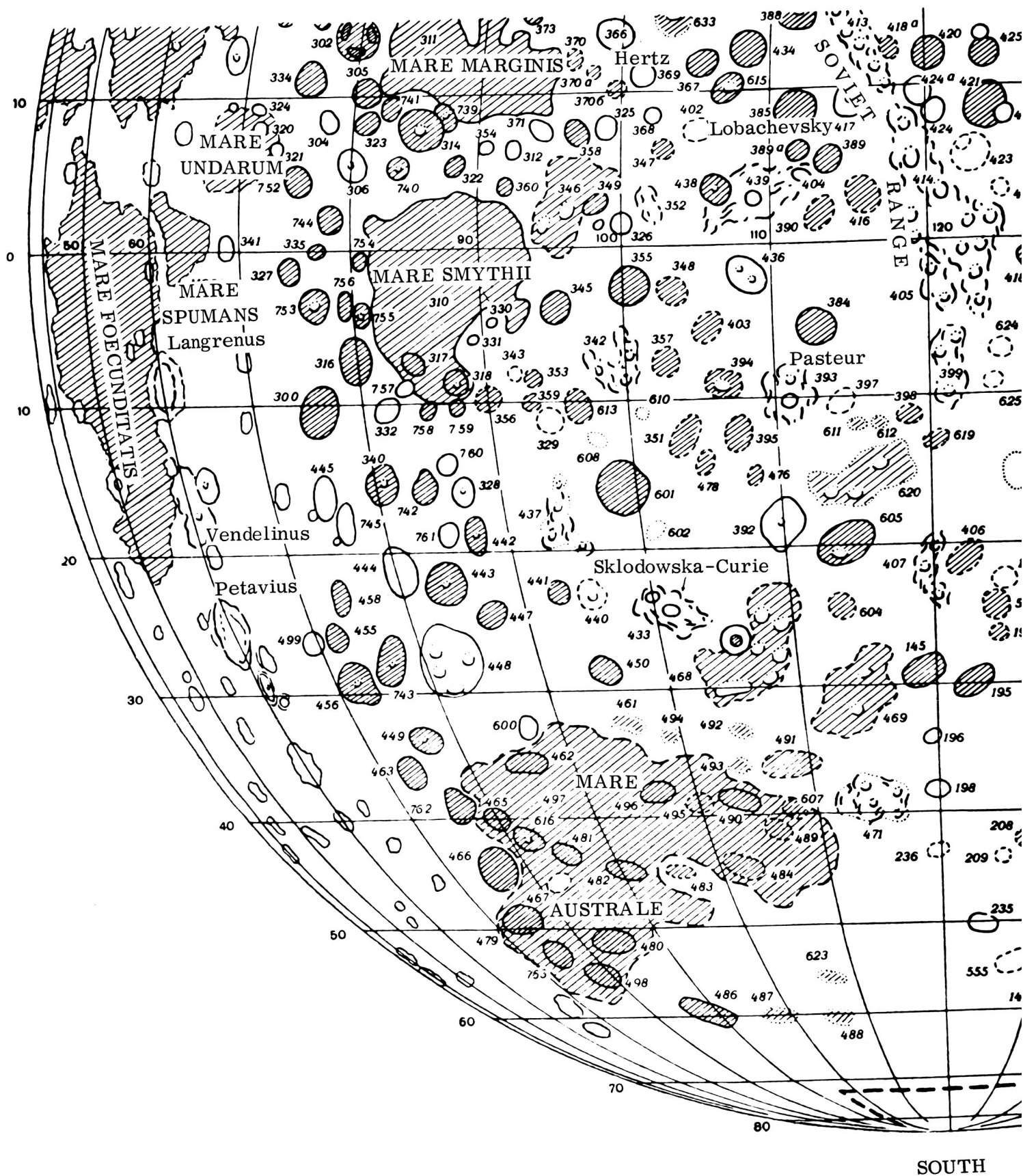
Scale 1 : 10, 000, 000





SECTION OF THE MAP OF THE FAR SIDE OF THE MOON -  
THE NORTHEAST PART





CATALOGUE OF FORMATIONS ON THE FAR SIDE OF THE MOON,  
ACCORDING TO PHOTOGRAPHS OBTAINED  
BY THE AUTOMATIC INTERPLANETARY STATION  
ON 7 OCTOBER 1959.



Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
1	101 Tze-Chun- -Chi	29 27 35 31	10 3d, 7d, 6d, 2d 10, 9 9, 10	Bright spot on gray background. Taken from frame 29.	Stands out clearly in photometric cross sections of a number of primary negatives as a light, crater-like formation on a gray background. The rim is only suggested. The bottom and the rim are almost identical in brightness, but are significantly brighter than the surrounding surface. Described from frames 29, 31 and 35.	+141 <sup>0</sup>	+18 <sup>0</sup>
2	102 Kurchatov	29 31 27 35 26	11, 10 13, 12, 10, 9 3d, 7d, 6d, 2d 10 10, 11, 9	A bright spot. Stands out very brightly in 29 and 31. Drawn from frames 29 and 26.	A bright crater-like formation on a gray back- ground. The rim is outlined more clearly on the northwestern edge and becomes less clear on the Moscow Sea side. Stands out well on many photometric cross sections. It is somewhat elongated in the northwesterly direction. Described from frames 31 and 29.	+144	+32
3	104	27 29 35 22	2d 67, 10 2 3, 9, 10	Light spot on gray background. Drawn from frame 29.	A light, crater-like formation on a gray back - ground. The rim is slightly suggested. It is slightly elongated in a meridional direction. Situated directly next to formation 550. Described from primary negatives of frames 29 and 35.	+128	+10
4	106	27 29 31	2d 10, 64 8, 9	A light spot. Drawn frame 29 with a slight displacement.	A light, crater-like formation on a gray back- ground. The rim is barely noticeable, appearing brighter on the side of Tsiolkovskii. The bottom is somewhat darker than the rim. The outline is clear. It is somewhat elongated in a northeasterly direction. Described from frame 29.	+142	-04

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
5	107 Jules Verne	29 35 31 34 36	4, 8 9, 10, 8 8, 9, 12 9 8	Dark spot. Drawn from frame 29. The contour is clear.	A dark formation bounded by a gray background. The bottom is homogeneously dark, a rim is slightly noticeable. It is apparently a circular crater. Situated in the region of the Sea of Dreams. Described from frame 29.	+5 <sup>0</sup>	-37 <sup>0</sup>
6	115	29 31 35	10 9, 7 10	A light spot. Drawn from frame 29.	A white, crater-like formation on a gray back- ground. No rim is noticeable. It differs little in brightness from the surrounding surface. Described from frame 29.	+158	+29
7	116	29 27 31 34	9, 2d, 4d 3d 8	A dark spot surrounded by a lighter background. Drawn from frames 29 and 34.	A dark, crater-like formation on a gray back- ground. Outlined by a dark rim, which becomes lighter to the north and northwest. The bottom is inhomogeneous and differs little from the gray background to the south. Described from frames 29 and 34-8.	+151	-21
8	124	29 35 31	10 9 13, 12	A dark spot. The position is taken from frame 29, the shape and dimensions - from frames 29 and 35.	A dark, crater-like formation on a gray back- ground. A rim is noticeable, the bottom is inhomogeneous and differs little from the surrounding background. A lighter area, possibly caused by the presence of a central hillock, is noticeable in the middle of the formation. Described from frames 29 and 35.	+161	+32
9	137	29 31 27	64, 10 8, 9 3d, 2d	Light spot. Position and dimensions taken from frames 29 and 27.	A light, crater-like formation. A rim is noticeable, the bottom is inhomogeneous and, in places, differs little from the rim. A lighter spot is noticeable in the middle, which may be caused by a hill. Described from frames 29 and 31.	+166	+04

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
10	138 Mendeleev	29	4, 8	Dark spot.	A dark, cirque-like formation. A rim is noticeable, the bottom is homogeneous. The surrounding surface is noticeably lighter. Situated in the equatorial region. The image is elongated in the photographs in the meridional direction. Described from frame 31.	+167°	+02°
		31	9, 12	Position and			
		27	3d	dimensions taken			
		35	10, 9, 8	from frames 29 and 31.			
11	145	31	9, 13	Dark spot.	A dark, crater-like formation, having an inhomogeneous bottom, on a gray background. The image is elongated in the northwesterly direction. Described from frame 32.	+119	-29
		26	3	Position taken			
		34	5, 6	from frame 31.			
		32	8	Dimensions - from frame 32.			
12	146	35	10	Dark spot.	A dark, cirque-like formation on a gray background. Elongated in the meridional direction. Stands out sharply in photometric cross sections of a number of primary negatives. A rim is noticeable, the bottom is inhomogeneous and is somewhat darker in the north. Described from frame 35.		
		31	10, 13	Position taken			
		32		from frame 31,			
		29	10d	dimensions and			
		26	3d	and shape-from frame 26.			
13	175	29	10	A light spot.	A light, crater-like formation on a gray background. The inner part of the image is homogeneous with respect to brightness. No rim is noticeable. The formation definitely appears as circular in shape in photometric cross sections of a number of primary negatives. Described from frame 29.	+159	-07
		35	9, 10	Position taken			
		31	10	from frame 29,			
		27	3d	the shape and dimensions - from frames 29 and 35.			

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
14	185	36	1	Dark spot.	A dark-gray, crater-like formation on a gray back-ground. A rim is noticeable. The bottom differs little in brightness from the gray background and in places appears the same as the emerging rim. It is tangent to the image of object 427, which is about the same in structure. Described from frames 26, 29 and 34.	+128 <sup>0</sup>	+03 <sup>0</sup>
		29	9d	Position is taken from frame 29.			
		32	10	Dimensions and			
		26	11, 1d, 4d	shape - from			
		34	6	frames 36, 34, 26.			
15	190	29	10	Dark spot.	A gray, crater-like formation. Differs little from the surrounding background with respect to intensity. The bottom is apparently inhomogeneous. The rim barely emerges in places. It is elongated in the meridional direction. Described from 34 and 31.	+145	-30
		31	9, 10, 13	Position and			
		35	9	dimensions taken from frame 29.			
		34	2, 8				
16	191	34	7, 8	A light spot.	A light, crater-like formation. The bottom is inhomogeneous and there is a lighter part noticeable in the center of the image, which might be caused by a hill. Described from frame 34.	+140	-26
		27	2d	Position and			
		31	10	dimensions taken from frame 34.			
17	195	26	11, 12	Dark spot.	A dark, crater-like formation. The bottom is inhomogeneous. The rim is noticeable only in places and for the most part blends in with the surrounding background. The image is slightly elongated in the northwesterly direction. Described from frames 26 and 31.	+123	-30
		27	2d	Position taken from frame 31.			
		31	9, 10	Shape and di-			
		35	9	mensions - from			
		34	7, 8	frames 26, 31, 34.			
18	198	26	9, 10, 11	A light spot.	A light formation on a gray background shaped like the top of a hill or like a light crater. Described from frames 26 and 34.	+120	-38
		32	8	Position and			
		27	2d	dimensions taken from frame 26.			
		35	9				

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
19	200	29 35 27	9, 8 9, 10 3d	Dark spot. Drawn from frame 29.	A dark, crater-like formation on a gray back- ground. The image is somewhat elongated in the northwesterly direction. A rim is noticeable, which for the most part blends in with the surrounding background. Described from frames 27 and 29.	+156°	-36°
20	203	31 34 27 29	12 8 3d 10, 9	A light spot. Drawn from frame 31.	A light, slightly elongated formation on a gray background. Apparently a crater. Described from frame 31.	+142	-32
21	205	31 35 27 34	8, 9 9 4d 7	A dark spot. Drawn from frame 31.	A dark formation on a gray background. Apparently a crater. The bottom is inhomogeneous. The image is slightly elongated in the northwesterly direction. The rim does not emerge from the surrounding background. Described from frame 34.	+136	-34
22	206	29 27 35 34	10 4d 9 7	A light spot. Drawn from frames 34 and 29.	A light formation on a gray background. The bottom is not homogeneous. A rim is noticeable and is bright in the northwest. Elsewhere, the rim differs little in brightness from the surrounding background. Possibly this is a crater or an unevenly light hill-top. Described from frames 34 and 29.	+132	-36
23	228	31 32 34 35	9 9 8 7	A light spot. Drawn from the frame 34.	A bright, crater-like formation on a gray back- ground. A rim is noticeable, which blends in with the surrounding background in places. Image of the object is elongated in the northerly direction. Described from frames 34 and 31.	+155	-29

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
24	230	29 31 34	64 10 8	A light spot. Contour taken from frame 34.	A light formation on a gray background. A rim is noticeable. The bottom is inhomogeneous. Described from frames 31 and 34.	+137°	-40°
25	234	27 29 31 32	3d 9 12 8	A dark spot. Position taken from frame 29. Configuration taken from frames 29 and 32.	A gray formation on a light background. Apparently a crater. The bottom is inhomogeneous with respect to intensity. A rim is noticeable. Described from frames 29 and 32.	+130	-11
26	235	26 27 34 31	11 3d 7 10	A significantly bright light spot. Drawn from frame 34.	A light formation that stands out on a gray background. Apparently either a hill-top or a crater. Described from frame 34.	+124	-50
27	300 Lapeyrouse	32 28 26 36	5, 6, 7 18, 19 2, 4, 12, 14 5	A gray spot on a gray background. Shape and di- mensions taken from frame 26.	A gray, crater-like formation, bordered by a barely visible rim, on a gray background. The bottom is inhomogeneous. The presence of several craters is felt. Their position and dimensions coincide with Lapeyrouse. Described from frame 26 - 14.	+76	-11
28	301	26 28 32 36	4 19, 23, 6 4 1, 4, 5	A dark spot on a gray background. Drawn from frame 28.	A dark, crater-like formation on a gray background. Stands out by its lower reflecting ability in comparison with the surrounding surface. It closely matches an unnamed crater, in coordinates and dimensions, that is shown on Wilkins' map. (Table XII).	+71	+18

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
29	302 Lover (Lower)	26 28 32 36	4 18 4 6, 3, 4, 5	A dark spot on a gray background. Drawn from frame 28.	A dark formation, bounded by an unclear rim that is unnoticeable in the southwest and north, on a gray background. The bottom is inhomogeneous. There are apparently several dark craters within: in the east, the west and south. It matches closely the position and dimensions of Lover. Described from frame 26 - 4.	+71 <sup>0</sup>	+18 <sup>0</sup>
30	303	38 36 26 32	18, 19, 20 1, 3, 4 2 2	A small dark spot on a gray background. Drawn from frame 28.	A dark formation on a gray background apparently a crater. Bordered by a narrow, poorly visible rim. The central part of the bottom is somewhat brighter than the eastern or western parts. It closely matches a crater, in coordinates and dimensions, that is shown in Wilkins' map. Described from frame 26 - 2.	+76	+15
31	304	36 26 28 32	2 2 18 2	A light spot on a gray background. Drawn from frame 28.	A light, crater-like formation on a gray background. The bottom differs little from the surrounding background. It is bordered by a dark rim that is lighter in the north and southwest. Its position is close to that of crater F on Wilkins' map (Table XII + 947, + 148) and to crater C on Neison's map. It is somewhat larger than crater F. Described from frame 26 - 2.	+78	+8
32	305	26 32 48	1, 2, 12d 4 3	A gray spot on a light background. Drawn from frame 28.	A gray, crater-like formation on a light background. A gray rim shows. The bottom is inhomogeneous and darker to the northwest. In position and dimensions it closely matches a crater shown in Wilkins' map. (Table XI + 995, + 955, + 185). Described from frame 28 - 3.	+81	+10

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
33	306	26 32 36	2, 12 8, 2, 4 5, 1, 6, 7	A light spot on a gray background. Position and configuration taken from frame 26.	A light, crater-like formation, bordered by a dark rim, on a gray background. The bottom is inhomogeneous and is light in the south. Possibly this means a hill is present. It closely matches crater E, in position and dimensions, on Wilkins' map (Table XI +982, +70). Described from frame 26 - 2.	+80°	+5°
34	307 Alhazen	26 36	2d 3	A gray spot on a gray background. Drawn from frame 26.	A gray formation on a somewhat grayer background, apparently a crater. Bordered by a hazy dark rim. Close to Alhazen in position and dimensions. Described from frame 26 - 2.	+73	+15
35	310 Mare Smythii	On all cross	frames, on all sections.	A dark spot. Configuration taken from frame 26.	Mare Smythii - a dark formation on a light background, in which are noticeable separate dark craters. In contrast to prevailing opinion that it is lighter than Mares - Marginus, Spumans and Undarem, it turned out to be substantially darker than these under the conditions of illumination existing at the moment of photographing. Its verified boundaries correspond to +4, -10° latitude, and +82, +94° longitude. The outlines of Mare Smythii are less crooked than those of Mare Marginus. Described from frames 26 and 28.		
36	311 Mare Marginus	On all cross	frames, on all sections.	A dark spot. Configuration taken from frames 26 - 2 and 26 - 14.	Mare Marginus is a dark formation with a very crooked outline on a light background. It appears within the area bounded by +82, +96° longitude and +8, +18° latitude. It apparently consists of a number of dark crater-like formations that have dark bottoms. The formerly known boundary turned out to be inaccurate. Evidently, an area to the north, with coordinates +83, +88° longitude and		



Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
36					+18, +24° latitude, should not be included within Mare Marginus. The same pertains to an area adjacent to Mare Marginus on its Mare Crisium side and bounded by the coordinates +76, +81° longitude and +12, +18° latitude. This section consists of separate crater-like formations with bottoms that are lighter than the bottom of Mare Marginus. Described from frames 26 - 14 and 28 - 21.		
37	312	26 28 32	1, 2, 12, 4 3, 18, 20, 23 4	A light spot on a gray background. Configuration taken from frame 26.	A bright formation, bounded by a gray rim, on a gray background. It is about as bright as region 439. Apparently, it is a bright crater or a hilltop. Described from frame 26.	+92°	+07°
38	314 Neper	26 28 32 36	20, 23 20, 23 7, 8, 5 1, 2, 4	A dark spot. Position and dimensions taken from frames 26 and 28.	A dark, clearly outlined formation, bounded by a rim, on a light background. The bottom is inhomogeneous. There is a hillock in the center. It coincides with Neper in position and dimensions. Described from frame 26.	+86	+08
39	316 Kästner	26 36 32	2, 11 4, 3, 5 4	A dark spot on a gray background. Drawn from frame 26.	A gray, crater-like formation, bounded by a rim, which is lighter in the northeast, on a gray background. It closely approximates Kästner in position and dimensions. Described from frame 26 - 2.	+80	-7
40	317	26 28 32 36	2, 4 18, 19, 20, 21, 23 4 1, 3, 6	A dark spot on a dark - gray background. Dimensions and shape drawn from frame 26.	A dark crater-like formation on a dark background. Bounded by a dark rim. The bottom is homogeneously dark. Situated in a region of Mare Smythii that is visible from the Earth. Its position and dimensions are given inaccurately in Wilkins' and Neison and Franz's maps. Described from frame 26 - 2.	+84	-8

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
41	318	26 28 32 36	1, 2, 4 18, 19, 20, 21, 23 4 1, 2, 3, 4	A dark spot on a gray background. Drawn from frame 26.	A dark, crater-like formation on a gray background. Bounded by a hazy, dark rim. Situated in a region of Mare Smythii that is visible from the Earth. There is, possibly, a hillock in the center. Its position and dimensions are shown inaccurately in Wilkins' and Neison and Franz's maps. Described from frame 26 - 2.	+88°	-8°
42	319	28 26 32	18, 20, 23 14 2, 8, 7, 6	A light spot on a gray background. Drawn from frame 28.	A light formation on a gray background - apparently a crater. Bounded by a light rim, which blends in with the surrounding surface in the north. The bottom is somewhat darker in the southern part. Its latitude coincides with that of a crater on Wilkins' map, while its longitude differs by 3°. Described from frame 26 - 14.	+79	+19
43	320	26 28	4 3, 21, 23	A light spot on a dark background. Drawn from frame 28.	A light, crater-like formation, bounded by a dark rim, on a dark background. Situated in Mare Undarum. It closely resembles crater S in position and dimensions, as shown on Wilkins' map (Table XI +937, +132). Described from frame 28 - 3.	+71	+8
44	321	26 28	4 21	A light spot on a dark background. Drawn from frame 28.	A light, crater-like formation on a gray background. A hazy, dark rim shows slightly. Situated on the boundary of Mare Undarum. Closely resembles, in position and dimensions, the crater L in Wilkins' map (Table XI +944, +112). Described from frame 28 - 3.	+72	+07

Objects of the first order of certainty

No. n/ n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
45	322	32 26 28	4 2, 4, 14 18	A dark spot on a gray background. Drawn from frame 26.	A dark, crater-like formation, bounded by a hazy, dark rim on a gray background. In position and dimensions it closely approximates crater S, shown in Wilkins' map (Table XI +955, +100). Described from frame 26 - 2.	+88 <sup>0</sup>	+6 <sup>0</sup>
46	323	26 36 28	2, 14 6, 4, 5 18	A gray spot on a gray background. Drawn from frame 26 - 14.	A gray, crater-like formation on a light background. Its bottom differs little from the surrounding background. A dark rim, more clear in the north, shows through. The bottom is inhomogeneous and lighter to the south. In position and dimensions it closely resembles a crater on Wilkins' map (Table XI +962, +170). Described from frame 26.	+81	+08
47	324	28 35 32 26	3, 18, 19, 20 1 5	A light-gray spot. Drawn from frame 28.	A light-gray, crater-like formation on a gray background. Bordered by a dark rim. Situated in Mare Undarum. In coordinates and dimensions, it closely approximates crater P, shown in Wilkins' map (Table XI +930, +150). Described from frame 28.	+71	+9
48	325	26 28 32	12, 2 3, 20 4	A light spot. Drawn from frame 26.	A light formation on a gray background - apparently a crater, the bottom of which differs little from the surrounding, gray surface. It is bordered by a narrow, dark rim, which shows more clearly from northeast to southwest. Described from frame 26 - 2.	+99	+08
49	326	36 26 32	3, 4, 5, 6 2, 12, 11 4	A light spot. Drawn from frame 26.	A light formation on a gray background - apparently a crater with an inhomogeneous bottom, whose brightness increases to the south. Partly bordered by a light rim on the west. Described from frame 26 - 2.	+100	+02

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
50	327	26 36	2, 12 5, 6	A dark spot. Drawn from frame 26.	A dark, crater-like formation, bordered by a light rim, on a gray background. It closely approximates crater ( $\lambda$ ) on Neison's map in position and dimensions, and a crater shown in Wilkins' map, in position (Table XI +965, -15). Described from frame 26.	+74 <sup>0</sup>	-2 <sup>0</sup>
51	328	36 32 26	5 4 11, 12	A light spot. Drawn from frame 26 - 12.	A light, crater-like formation, bounded by a narrow, light rim, which disappears in the southwest, on a gray background. The bottom is inhomogeneous. There is, apparently, a hillock. Its position partly overlaps the southern part of crater E, which is arbitrarily drawn in Wilkins' map (Table X +960, -270). Described from frame 26 - 12.	+88	-15
52	330	26 28	11, 12 3	A light spot. Drawn from frame 26.	A bright formation that stands out sharply against the dark background. It appears as a round spot on the photometric cross section 26 - 12, while on the photometric cross sections 26 - 14 and 26 - 2 the light area, surrounding it and almost blending in with a similar area around contour 331, is clearly visible. It is apparently a crater, whose central part stands out in its brightness. Described from frame 26.	+91	-05
53	331	26 28	12 3	A light spot. Drawn from frame 26.	Exactly the same kind of formation as 330.	+89	-06
54	332	26 28	14, 12 Auxiliary. 19, 6	A light spot. Drawn from frame 26 - 14.	A light, crater-like formation on a gray background. Bordered by a poorly noticeable rim. Coincides in position and dimensions with a crater drawn on Wilkins' map. Described from frame 26 - 14.	+82	-11

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
55	334	26 28	1, 2d 3	A dark spot. Drawn from frame 26.	A dark formation on a gray background - apparently a crater. It is bordered by a light rim, which shows more clearly in the west. The bottom is inhomogeneous, being darker in the south. It closely approximates, in coordinates and dimensions, a crater situated in the peripheral zone on Wilkins' map. Described from frame 26 - 2.	+76°	+12°
56	335	28 26 36	21, 23, 6 2 3	A dark-gray spot. Drawn from frame 26.	A dark, crater-like formation, bordered by a hazy rim that is dark in the southeast, on a gray background. Possibly there is a central hillock. It coincides, in position, with a crater shown on Neison's map, but is somewhat larger in size. Described from frame 26 - 2.	+77	0
57	340 Behaim	26 28	1 18, 20	A gray spot. Drawn from frame 28 - 20.	The crater Behaim - a gray formation, bordered by a narrow, dark rim, on a light background. The bottom is inhomogeneous and several craters are noticeable. There is a central hillock where the bottom is brighter. It closely approximates the image of Behaim, in position and dimensions, as depicted on Wilkins' and Neison's maps. Described from frame 28 - 20.	+81	-15
58	341 Maclaurin	26 28 32	2, 14, 4 23, 6 2	A light spot. Drawn from frame 26.	A light, crater-like formation, bordered by a dark rim that is wider in the northeast, on a gray background. In size it closely resembles the image of Maclaurin on Wilkins' map. Its position does not coincide with the position of Maclaurin given in Wilkins' Table XI. Described from frame 26 - 2.	+69	0

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
59	345	26 28 36	14, 11, 12 18 3, 5, 6	A gray spot on a light background. Drawn from frame 26.	A gray formation on a light background - possibly a crater. The bottom differs little from the gray surface to the west. The bottom is darker in the south. It is bordered on the north by a wide, bright arc. The southeastern part is adjacent to Mare Smythii. It partly coincides with a crater shown in Wilkins' map in this area. Described from frame 26 - 12.	+95°	-04°
60	349	26 28 32 36	1, 2, 12 23, 21, 18, 6 4 1, 5	A dark spot. Drawn from frames 26 and 28.	A dark formation on a gray background. Possibly is a crater directly adjacent to 346. The bottom is dark. Described from frame 26 - 2.	+98	+03
61	352	26 28 32 36	12, 10, 11, 2 20, 23, 6, 3 4, 5, 6, 7, 8 3, 4, 5, 6	A light spot on a gray background. Drawn from frame 26.	A bright, somewhat elongated formation, apparently consisting of small, light details, on a gray background. Corresponds to 405 in brightness. Described from frame 26 - 2.		
62	354	26 28 36	2 23 3	A light spot on a gray background. Drawn from frame 26.	A light formation on a gray background. Possibly a crater bordered by a hazy dark rim. This formation is not indicated on Wilkins' map. Described from frame 26 - 2.	+91	+07
63	355	28 32 26	19, 20 4 12d	A gray spot on a light background. Drawn from frame 26.	A gray formation, possibly a crater with a very inhomogeneous bottom, on a light background. It is bounded by a lighter surface in the north, which becomes darker in the south than is the bottom of the crater. A narrow, dark rim is noticeable in the south. The bottom possibly consists of several independent formations. Described from frame 26 - 12.	+100	-02

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
64	358	26 28 32	14, 2 6, 18, 3 4	A dark spot on a gray background. Drawn from frame 26.	A dark formation on a gray background. Possibly a crater. Outlined by a narrow, dark rim. The bottom differs little from the surrounding surface and is inhomogeneous. A round dark spot is noticeable in the southwestern part. Described from frame 26 - 2.	+96 <sup>0</sup>	+08 <sup>0</sup>
65	360	26 36 28 32	2 3, 4 3 4	A gray spot on a gray background. Drawn from frame 26.	A gray formation on a light background. It is directly adjacent to Mare Smythii. It is bordered by a dark, narrow rim, which blends in with Mare Smythii in the south. Described from frame 26 - 2.	+92	+04
66	362	26 32 28	1, 2, 14, 4 7, 6 5	A gray spot on a gray background. Drawn from frame 26.	A gray formation on a light background. Possibly is a crater. The background differs little in intensity from the formation itself. The bottom is inhomogeneous, being lighter in the center. Described from frame 26 - 2.	+101	+17
67	361	26 32 28	1, 2, 4, 14 7 20	A gray spot on a gray background. Drawn from frame 26.	A gray formation on a light background. Possibly a crater with a homogeneous bottom. It is bordered in the northeast by a narrow dark rim. The rim is lighter in the southwest. The rim is unclear in the south. Described from frame 26 - 2.	+102	+22
68	363	26 28 36	1, 11 20, 6 3, 5, 4	A dark spot on a gray background. Drawn from frame 26.	A dark formation on a gray background. The central part differs little from the background. The boundary is clear in the east, north and west in the form of a narrow rim. The formation is somewhat lighter in the west. Described from frame 26 - 1.	+99	+21

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
69	364	26 28 36	1, 11 20 2	A dark spot on a gray background. Drawn from frame 26 - 1.	A dark formation on a gray background. Outlined by a thin line. The central part is inhomogeneous and is darker in the center. Described from frame 26 - 1.	+97 <sup>0</sup>	+22 <sup>0</sup>
70	365	26 32 36	11, 1, 2, 4 2, 6, 7 4, 3, 6, 5	A gray spot on a light background. Drawn from frame 26 - 1.	A gray formation on a light background. Possibly a crater. The bottom is inhomogeneous, being lighter in the south. A bright, hill-like formation is noticeable in the center. Bordered by a rim in the north and east. Described from frame 26 - 1.	+104	+20
71	366 Popov	29 26 32 28	2 2, 4, 14 8, 7, 6, 2 20 does not contradict.	A light spot. Drawn from frame 26.	A light, round formation on a gray background - apparently a crater. Bounded by a dark rim in the north and south. The bottom is inhomogeneous, the northern part being lighter than the southern. Possibly consists of two tangent craters. Described from frame 26 - 14.	+99	+14
72	367	26 28 36	2, 4, 14 20, 18 and 19 1, 2, 3, 4, 5	A gray spot. Drawn from frame 26.	A gray formation, bordered all around by a dark band, on a gray background. The band disappears only in the south. The central part is inhomogeneous, being somewhat lighter to the north. Described from frame 26 - 14.	+105	+12
73	368	26 28 32 36	4, 11, 1 3, 20 4, 5 3	A light spot. Drawn from frame 26.	A light formation, having a light rim in the south, on a light background. Possibly a crater. The bottom of the crater is lighter in the north. Described from frame 26 - 1.	+102	+09



Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
74	369 Hertz	26 28 32	12, 14 3, 6, 19, 20 8, 7, 6, 2	A light spot. Drawn from frame 26.	A bright formation on a gray background. Apparently a crater. Described from frame 26 - 14.	+101°	+11°
75	371	26 28 32	12, 2 18, 3 4	A light spot. Drawn from frame 26.	A light formation on a gray background. Possibly a crater. The bottom differs little in brightness from the surrounding surface. The southwestern part of the bottom is somewhat lighter. It is partly overlapped by a crater shown on Wilkins' map of the libration zone. Described from frame 26 - 2.	+94	+08
76	372	32 36 26	2, 4, 5 1, 2, 3, 5 14	A gray spot. Drawn from frame 26.	A gray formation on a light background. Possibly a crater. It is bordered in the south by a light rim. The bottom is darker in the northern part of the crater. Described from frame 26 - 14.	+96	+18
77	373	26 28 32 36	14 19, 20, 21 2, 6 5, 6	A dark spot. Drawn from frame 32 - 6.	A dark formation, bordered by a narrow, dark line in the northeast and north, on a gray background. Possibly is a crater. The bottom is somewhat lighter in the west. It appears as a light formation on a gray background in cross section 36 - 6. Described from frames 32 - 6 and 36 - 6.	+93	+14
78	374	28 32 26	20 2 14	A light spot. Drawn from frame 26 - 14.	A light formation on a gray background. It is apparently a crater, bordered by a narrow, dark line. The bottom is lighter than in object 387. A light dot is noticeable within the contour - it is apparently a hill. Described from frame 26 - 14.	+94	+18

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
79	375	28 32 26	20 5, 2, 6 14	A gray spot. Drawn from frame 26 - 14.	A round formation seen as a gray spot on a light background and as blending in with the rim of 362 in the southwest. Described from frame 26 - 14.	98°	+19°
80	376	26 28 32 36	14, 12, 11 18, 6 4, 5, 6, 7, 8 All cross sections.	A light spot. Drawn from frame 32 - 6.	A bright formation on a gray background, the latter determining the former's boundary. The central part is inhomogeneous and a darkening is noticeable in the center. Described from frame 32 - 6.	+91	+17
81	377	26 28 32 36	12 20 7, 6 2, 3, 4, 5, 6, 7	A light spot. Drawn from frame 26 - 12.	A light round formation on a dark background. There is possibly a light hill inside. Its position is partly overlapped by and its size coincides with a crater drawn on Wilkins' map. Described from frame 26 - 12.	+87	+21
82	378	26 28 32	12, 11 21 5, 6, 7	A light spot. Drawn from frame 26 - 11.	A light formation, bordered by a narrow dark rim, on a gray background. Apparently a crater with an inhomogeneous bottom that is lighter in the center. Its position is overlapped by a crater drawn on Wilkins' map, but its size exceeds the latter's somewhat. Described from frame 26 - 11.	+89	+23
83	380 Edison	26 28 32 36	1, 2, 4, 12 18, 19, 20, 21, 6 2, 3, 5, 6 4	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation on a gray background. The brightness of the bottom lies between that of details of 645 and 653. It is bounded by a light border on the northeast and north. Described from frame 26 - 1.	+100	+24

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
84	381	26	2, 12	A dark spot. Drawn from frame 26.	A dark formation on a light background - apparently a crater. Its position is partly overlapped by a crater shown on Wilkins' map, but its size somewhat exceeds that of the latter. Described from frame 26 - 12.	+87°	+23°
		28	18, 19, 20, 21				
		32	2, 4, 5				
		36	1				
85	382	26	12, 2	A dark spot. Drawn from frame 26 - 12.	A dark formation, bounded by a hazy gray rim, on a gray background. Possibly a crater. The bottom is somewhat darker in the southeast. Its position is overlapped by and its size coincides with a crater shown on Wilkins' map. Described from frame 26 - 12.	+86	+19
		28	6				
		36	1				
86	383	26	2	A dark spot. Drawn from frame 28 - 20.	A dark formation, which looks like a crater with a somewhat inhomogeneous bottom, on a gray background. It is bounded by a gray rim that is clearer in the west and north. The bottom is darker in the southeast. Described from 32 - 3.	+106	+24
		28	18, 19, 20, 3, 6				
		32	2, 3, 7				
		36	2, 3, 4				
87	384	26	12, 11	A gray spot. Drawn from frame 26.	A gray formation, bounded on the north by a narrow, dark rim, on a light background. The rim is lighter in the south. Apparently, it is a crater with an inhomogeneous bottom. Lighter portions are observed in the central part of the bottom. Described from frame 26 - 2.	+112	-05
		28	18				
		32	2, 6, 5				
		36	3, 5, 6				
88	385 Lobachev- skii	26	1, 11, 2	A dark spot. Drawn from frame 26 - 11.	A dark formation on a light background. Apparently a cirque. It is bounded on the west by a bright background that is adjacent to the light area of 414. Described from frame 26 - 11.	+85	+23
		28	6, 19, 20				
		32	6, 7				
		36	4, 5, 6				
		29, 31	2				

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
89	386	28 32 26	18, 20 2, 6, 8 12	A light spot. Drawn from frame 28 - 13.	A light formation on a gray background. Possibly a a crater with a hazy rim. It almost coincides in position and dimensions with a crater shown on Wilkins' map. Described from frame 26 - 12.	+85°	+23°
90	387	26 28 32 36	1 20 2, 7 6	A dark spot. Drawn from frame 26 and 32.	A dark, crater-like formation on a gray background. Bounded by a rim in the east and southeast. On the west the rim is hazy and becomes a small crater. The bottom is somewhat lighter in its northern part. Described from 26 and 32.	+95	+20
91	388	26 32 36	1, 2 3, 2 3, 4, 5, 6	A gray spot. Drawn from frame 26 and 32.	A gray, elongated formation on a light background. Bordered by a dark band that lightens in the north. The bottom is inhomogeneous, being lighter in the center. This is apparently a hillock. Described from frame 26 - 1.	+112	+16
92	389	26 28 36 32	10 20 1, 4, 5, 6 10	A dark spot. Drawn from frame 26.	A dark formation, bordered by a narrow, black line, on a gray background. Possibly a crater. A light rim is noticeable in the northwest. The bottom is darker to the south. Described from frame 26 - 10.	+113	+05
93	389a	26 28 36	10 5 2	A dark spot. Drawn from frame 26.	A dark formation, bordered in the southeast by a narrow, dark rim, on a gray background. Possibly it is a crater with an inhomogeneous bottom. The bottom is lighter in the south and differs little from the surrounding gray background. Described from frame 26 - 10.	+113	+06

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
94	392	31 26 32 29	3 12, 11 5, 6, 7 10	A light spot. Drawn from frame 26 - 12.	A light formation, bordered by a broken rim, on a gray background. Possibly a crater with an inhomogeneous bottom, which is darker in the north. The central and southern parts of the bottom are substantially brighter than the surrounding background. Described from frame 26 - 12.	+110°	-18°
95	393 Pasteur	32 28 26	7 19 2, 10, 11	A light spot. Drawn from frame 26.	A bright region that is bounded by the surrounding gray background. It consists of round formations in frame 26 - 10. A light ring is noticeable around a light, round formation, and between them are dark bands. It approximates 439 in brightness. It apparently consists of a number of separate, light details. Described from frames 26 - 2 and 26 - 10.	+111	-10
96	399	26 28 32	9, 10 19, 6 10, 9	A bright spot. Drawn from frame 26 - 9.	A bright formation on a gray background, consisting of small, bright details. The northern part is somewhat darker than the southern. It apparently is part of the large, bright complex of 414. Described from frame 26 - 9.	+122	-08
97	404	26 32	11 2, 6	A light spot. Drawn from frame 26.	A bright area situated in the eastern part of the bright region 439. Described from frame 26 - 11.	+112	+05
98	405	26 32 36	9 2, 10 3, 5	A bright spot. Drawn from frame 26.	A bright formation on a gray background, consisting of separate bright details. Apparently, it is part of the general bright region of 414. Described from frame 26.	+121	-03

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
99	409	26 28 32 36	1, 10d 6 10, 9, 8, 2 1, 2, 3, 4, 5, 6	A dark spot. Drawn from frames 26 and 32.	A dark formation, bounded by a dark, narrow, rim that becomes lighter in the south, on a light background. Possibly a crater. A relatively dark portion of the surface is tangent to the rim in the north. Described from frame 26.	+119 <sup>0</sup>	+18 <sup>0</sup>
100	411	26 32 31	1, 10, 11d 10, 2 3	A light spot. Drawn from frame 26.	A light formation, surrounded in the north by a hazy rim, on a gray background. A darkening is noticeable in the northern part. Described from frame 26 - 1.	+121	+17
101	412	26 28 32 36	11, 2 18, 19, 6, 3 10, 9, 8, 2 3, 5, 6	A bright spot. Drawn from frame 26.	A bright formation, apparently consisting of two round formations, on a gray background. It lies in the path of the ray going from formation 699. The brightness decreases in its southeastern part, and begins to blend in with the background around formation 413. Described from frame 26 - 11.	+112	+18
102	413	26  28 32 36	10 trial and auxiliary cross sections 19, 20, 6, 18 2, 3, 10, 8 3, 5, 6	A bright spot. Drawn from frames 26 and 32.	A light elongated formation on a gray background. Brighter in some places. Apparently consists of separate formations, the brightest of which are situated in the southwestern and northeastern parts. Described from frames 26 and 32.	+115	+14

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
103	414 Soviet Range	26	9, 10	A bright spot. Stands out on all frames. Drawn from frame 26 - 9.	The Soviet Range is a bright formation on a gray background, consisting of a large number of separate bright details. Its general contour lies in a northeasterly direction and broadens noticeably in the equatorial region. It is mountain-like in its reflective properties and is more homogeneous, with respect to brightness in its northern part. Separate bright details become visible in the southern part on high photometric cross sections. There is a darkening in the southwestern part. Apparently formation 413 is also a part of the Soviet Range. Described from frame 26 - 9.	+118 <sup>0</sup>	-09 <sup>0</sup>
		28	19, 20, 6, 18			+124	-05
		32	2, 3, 10, 8				
		36	3, 5, 6				
104	417	26	9, 10d	A light spot. Drawn from frame 26 - 10.	A light, crater-like formation, bordered by a narrow, dark rim in the northwest and northeast. The bottom is inhomogeneous and lighter in the south. A lighter spot is noticeable in the center, which must be caused by a hill. Described from frame 26 - 10.	+115	+09
		28	18, 19, 20, 6				
		32	2				
105	418	26	12, 11, 6d	A light spot. Dimensions taken from 26 - 12. Drawn from frame 26 - 12.	A gray formation on a light background. Possibly a crater. The bottom differs little from the background. A dark rim is noticeable and is clearer in the north and west, becoming narrower in the southeast. The brightness of the bottom is inhomogeneous - the bottom becomes darker in the southwestern part. Described from frame 26 - 12.	+127	-02
		28	20				
		29	2				

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
106	420	26 32 29	11 1, 4, 5 3	A gray spot. Dimensions taken from frame 26.	A gray, crater-like formation on a light back - ground. Bounded by a light rim in the north. The bottom is inhomogeneous and is somewhat darker in the southeast. Described from frame 26 - 11.	+120 <sup>0</sup>	-12 <sup>0</sup>
107	421	26 32 36	11 10 5	A dark spot. Drawn from frame 32.	A dark, round formation on a gray background - possibly a crater. The bottom is inhomogeneous and is somewhat lighter in the southeast. The bright crater 422 is situated on its southwestern boundary. Described from frame 32 - 10.	+124	-09
108	422	26 32 36	11 10, 2, 3 5	A light spot. Drawn from frame 32 - 10.	A bright formation, intersecting the boundary of 421, on a gray background. Possibly a crater. Described from frame 32 - 10.	+125	+08
109	424 and 424a	26 32 36	11 10 1, 4, 5	A light spot. Consists of two separate spots. Drawn from frame 26 - 2.	An elongated, light formation, possibly consisting of two intersecting craters, on a gray background. Bounded by a dark rim. The rim of 424a predominates at the place of intersection and and appears to be the younger of the two rims. Described from frame 26 - 2.	+121  +119	+08 south +09 north
110	425	26 32 32 36	11, 1 10 3 5	A dark spot. Drawn from frame 26 - 10.	A dark formation, bordered by a dark rim, on a gray background. Possibly a crater. A bright, round formation is situated in the northern part of the rim. The bottom is inhomogeneous and lighter in the west. Described from frame 26 - 10.	+123	+13



Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
111	430	26 32 28	10, 11 3 6	A light spot. Drawn from frame 28 - 6.	A light formation on a gray background. Possibly a crater. The bottom differs little from the gray background and its brightness increases in the eastern part. The formation is bounded in the east by a dark, narrow line which becomes a darker, broader band in the west. Described from frame 28 - 6.	+115°	+21°
112	433 Skłodov- skaia- -Curie	26 28 32  36 29, 31	12, 11, 10, 1 18 2, 4, 3, 8, 7, 6 2, 5, 6 2	A light formation. Drawn from frame 26.	A bright formation with hazy contour on a gray background. It stands out in intensity on most of the primary negatives. It apparently consists of separate, very bright formations, which almost blend into one another and present a mountainous formation. Described from frames 26 - 11 and 26 - 12.	+102	-23
113	434	26 28 32 36	14, 1 20 2, 3 3, 5, 1	A dark spot. Drawn from frame 26 - 1.	A dark formation, bounded on the east and south by a dark band, on a gray background. Possibly a crater. The bottom is inhomogeneous and differs little from the surrounding background. There is a darkening in the center. Described from frame 26 - 1.	+108	+13
114	436	28 26 32 29	19 10, 3d 3 2	A light spot. Drawn from frame 26 - 3d.	A light formaion on a gray background. It is bordered by a narrow, light rim in the northwest and southwest. The rim disappears in the east. Possibly, it is a crater with an inhomogeneous bottom, which is darker in the southeast. Two bright spots are noticeable in the central and northeast parts. These are possibly hills. Described from frame 26 - 3d.	+108	-02

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
115	438	26 32 36	11 6, 7, 5, 8 2	A gray spot. Drawn from frame 26 - 11.	A gray formation on a light background. Possibly a crater. It is tangent to the bright formation 439 in the west. The rim is unclear. The bottom is inhomogeneous. There is a lighter spot in the center, possibly caused by a hill. Described from frame 26 - 11.	+106°	+04°
116	439	26 32 29	11d 2, 3 10	A light spot. Drawn from frame 26 - 11.	A light area of irregular shape on a gray background. It apparently consists of separate bright formations that are noticeable on the high photometric cross sections. The brighter part in the center is circular. A separate circle outlines a portion in the east of the formation. Described from frame 26 - 11.	+109	+03
117	441	26 28	1 18	A dark spot. Drawn from frame 28.	A dark, crater-like formation with a hazy light rim, on a gray background. It closely approximates, in position and dimensions, crater K shown in Wilkins' map of the libration zone. Described from frame 28 - 18.	+94	-23
118	442 Raureich	26 32	12, 11, 9, 10 2, 4	A gray spot. Drawn from frame 26 - 12.	A gray, crater-like formation, bordered by a dark rim on the north and northwest, which becomes barely noticeable in the south and southeast, on a light background. The bottom is inhomogeneous being lighter in the south. There is a bright spot in the center - apparently a hill. In position and dimensions it closely resembles the crater Raureich, shown in Wilkins' map (Table X+948, -320). Described from frame 26 - 12.	+88	-18

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
119	443	26 28 32 36	1, 12, 11 18 4 1, 3, 4, 5	A dark spot. Drawn from frame 28 - 18.	A dark, crater-like formation on a gray background. The bottom is inhomogeneous and possibly has a hill in it. Its coordinates and dimensions closely resemble a crater shown in Wilkins' map of the libration zone. Described from frame 28 - 18.	+84 <sup>0</sup>	-22 <sup>0</sup>
120	444 Hecataeus	26 28 32 36	1, 10, 12, 11 19, 18 6 6	A light spot. Drawn from frame 28 - 18.	A gray, crater-like formation on a gray background. It has an inhomogeneous bottom, bordered by a narrow rim in the west and east. The contour is blotted out in the north by disturbances. Separate, small craters are noticeable within the formation. Its position partly overlaps Hecataeus as shown in Neison's and Wilkins' maps. Described from frame 28 - 18.	+81	-21
121	445	26 28 32	12 20 6	A gray spot. Drawn from frame 26 - 12.	A gray, crater-like formation, bordered by a dark background. The rim blends in with the surrounding background in the northeast. A small crater is tangent to the rim in the southeast. Its position and dimensions are close to crater E on Neison's map. Described from frame 26 - 12.	+75	-16
122	447	26 28 36	11, 12 20 5	A dark spot. Drawn from frame 26 - 11.	A dark, crater-like formation, bordered by a dark, narrow rim which becomes hazy in the southwest, on a gray background. The bottom is inhomogeneous, apparently having small craters in it. Its position is close to that of a crater drawn on Wilkins' map of the libration zone. Described from frame 26 - 11.	+88	-24

Objects of the first order of certainty

No. n/ n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
123	448 W. Humboldt	26 28	12 18, 19, 20, 21	A gray spot. Drawn from frame 28 - 18.	A gray formation, bounded by a dark rim, on a dark background. The inhomogeneous bottom differs little in brightness from the surrounding background. Small craters, situated on the bottom, are noticeable. In position and dimensions it closely resembles W. Humboldt, shown on Wilkins' map. Described from frame 28 - 18.	+82°	-28°
124	449	26 28	11, 12 19, 20	A dark spot. Drawn from frame 26 - 11.	A dark, crater-like formation on a gray background. The brightness of the inhomogeneous bottom increases toward the center. There is, apparently, a central hill. Its position closely resembles a crater on Wilkins' map. Described from 26 - 11.	+78	-34
125	450	26 28	2 20, 21	A dark spot. Drawn from frames 26 and 28.	A dark, crater-like formation, bordered by a broad, dark rim, on a gray background. The bottom differs little in brightness from the surrounding brightness. In position and dimensions it closely resembles crater C shown on Wilkins' map of the libration zone. Described from frames 26 and 28.	+95	-28
126	455	26 28 36	1, 2, 12 19, 20, 21 4	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation on a gray background. It is bordered by a hazy, light rim in the west and a hazy, dark one in the southeast. In position and dimensions it closely resembles crater A on Wilkins' map. (Table X + 866, +430). Described from frame 26 - 1.	+72	-26

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
127	456 Legendre	26 28 36	12 18, 19, 20 3, 5, 4	A gray spot. Drawn from frame 26 - 12.	A gray, crater-like formation with an inhomogeneous bottom on a light background. It is bordered by a narrow, light rim in the north and a broader, light rim in the south. Small craters are noticeable on the rim in the south, west and north. There is possibly a hill in the center. In position and dimensions it closely resembles the crater Legendre. Described from frame 26 - 12.	+72°	-29°
128	458	26 36	1 5	A dark spot. Drawn from frame 26 - 1.	A dark, elongated formation, bordered by a narrow, light rim, on a gray background. Its position is close to a crater on Wilkins' map. Its dimensions are greater. A crater is arbitrarily drawn in at this point in Neison's map. Described from frame 26 - 1.	+74	-23
129	462	26 28	2, 12 18, 19, 20, 21, 6, 23	A dark spot. Drawn from frame 26 - 2.	A dark formation, clearly outlined by the surrounding gray background. The bottom is dark and there is apparently a crater in the eastern part. In position and dimensions it closely resembles a crater shown on Wilkins' and Neison's maps. Described from frame 26 - 2.	+86	-35
130	463	26 28 36	2 18, 19, 20 4	A gray spot. Drawn from frame 26 - 2.	A gray, crater-like formation on a light background. It is bordered by a hazy, light rim, which blends in with the surrounding background in the northwest. The contour is unclear. The bottom is inhomogeneous. In position and dimensions it closely resembles a crater on Wilkins' map. Described from frame 26 - 2.	+73	-37

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
131	465	26 28	1, 2, 12 19, 20, 6	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation on a gray back- ground. The contour is clear in the northwest and southeast. The bottom is dark and approximates that of Mare Smythii in intensity. It is not accurately designated on existing maps. Described from frame 26 - 1.	+80°	-40°
132	466 Oken	26 28	2, 12 19, 20, 23	A gray spot. Drawn from frame 26 - 2.	A gray, crater-like formation, bordered by a narrow, dark rim in the southeast, which becomes lighter and barely noticeable in the northwest, on a light background. The bottom is inhomogeneous and dark in the southwest. There is a hill in the northeastern part. In position and dimensions it is close to Oken. Described from frame 26 - 2.	+77	-44
133	479	26 28 32	1, 2, 11, 12 23 5	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation on a gray back- ground. The contour is clearly defined by the surrounding background. The bottom is dark and approximates that of Mare Smythii in intensity. It possibly consists of two craters. A crater that is quite similar to this one is shown on existing maps. Described from frame 26 - 1.	+73	-49
134	480	26 28	2, 11, 12 23	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation, bordered by a narrow, barely visible rim, on a gray back- ground. The bottom is very dark and approximates that of Mare Smythii in intensity. The crater is clearly outlined. Its position and dimensions are inaccurately shown on existing maps. Described from frame 26 - 1.	+84	-51

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
135	481	26 28	12 20	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation, clearly outlined in the south, on a gray background. There is no clear outline in the north. The position and form are inaccurately shown on existing maps. Described from frame 26 - 1.	+86°	-43°
136	482	29 26 28	9d 12 19	A dark-gray spot. Drawn from frame 26 - 12.	A dark formation on a gray background. Apparently a crater with a dark bottom. It is tangent to a gray portion of the surface in the north. Described from frame 26 - 12.	+91	-44
137	486	26 28	11, 10 18, 19	A dark spot. Drawn from frame 28 - 18.	A dark, crater-like formation with a dark bottom on a gray background. It is bounded in the south by a dark band. Its position and dimensions are shown inaccurately in Wilkins' map of the libration zone. Described from frame 28 - 18.	+90	-59
138	490	26 28 31 30	2, 11, 12 19	A dark spot. Drawn from frame 26 - 12.	A dark formation on a light background - possibly a crater. It is surrounded by a broad, light band in the south and southwest, which almost blends in with the surrounding surface in the north. The bottom is dark. Described from frame 26 - 12.	+103	-38
139	496	31 26 28 36	10 12 19, 6, 23 4	A dark spot. Drawn from frame 26 - 12.	A dark formation on a gray background - possibly a crater with a dark bottom. Bordered by a light rim in the north. Described from frame 26 - 12.	+97	-38

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
140	497 Mare Australe	26	12	A dark spot.	A large region with a decreased reflecting ability, within which there is a large number of craters having dark bottoms. Up until now, according to observations of the libration zone, it was bounded by $-45^\circ$ , $-60^\circ$ latitude and $+74^\circ$ , $+90^\circ$ longitude. The better established shape of Mare Australe, on the basis of obtained photographs, makes it possible to assume that it lies within $+70^\circ$ , $+110^\circ$ longitude and $-33^\circ$ , $-59^\circ$ latitude. It is of irregular shape. Its darkest portions are situated near $+90^\circ$ longitude and on either side of this. The reflecting ability of the surface around $\beta = 40^\circ$ and $\lambda = +95^\circ$ , $+110^\circ$ increases. Portions of the lunar surface that possess a significantly larger reflection coefficient are tangent to Mare Australe in the north, west and southwest. Described from frames 26 - 12, 29 - 9, 31 - 10.	$+95^\circ$	$-40^\circ$
		28	19, 20, 23	Drawn from frames			
		32	5	26 - 12, 29 - 9,			
		36	1, 2, 3, 4	31 - 10.			
141	498	26	1, 11	A dark spot.	A dark formation on a gray background. It is bordered by a light rim, which separates it from the formation 480. It is apparently a crater with a dark bottom. This crater closely resembles Hanno, as if continuing the latter. Its position and dimensions are shown inaccurately in existing maps. Described from frame 26 - 1.	$+79^\circ$	$-56^\circ$
		28	23	Drawn from frame 26 - 1.			



Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
142	499	28 26 36	20 12 6	A gray spot. Drawn from frame 28.	A gray, crater-like formation, bordered by a barely noticeable, dark rim. In the west the boundary blends in with the neighboring formation 455, whose bottom is relatively dark. In position and dimensions it closely resembles crater B, shown in Wilkins' map (Table X + 856, -425). Described from frame 28 - 20.	+69°	-26°
143	505	31 29 27	3 10 3d	A dark spot. Position and configuration taken from frame 29.	A dark, crater-like formation on a gray background. Described from frame 29.	+152	-13
144	506	31 29 35 27	3, 8 8, 4 3 3d	A light spot. Drawn from frame 29.	A light, crater-like formation on a gray background. The bottom differs little in intensity from the surrounding background. Described from frame 29.	+167	-32
145	508	31 29 35 27	10, 4 10, 8 3 3d	A light spot. Drawn from frame 29.	A light, crater-like formation on a gray background. A rim is noticeable. The bottom is inhomogeneous and differs little from the background. Described from frame 31 - 4.	+151	-51
146	517	31 29 35	4, 9 10, 10d 3	A dark spot. Taken from frames 31 and 29.	A dark, circular formation. A rim is noticeable. Possibly there is a hill in the center. Described from frame 31.	+173	+41

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
76	521	31	4	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray background. A rim is noticeable. The bottom is inhomogeneous and differs little from the background. Possibly there is a hill in the center. Described from frame 31.	-176°	+26°
		29	10				
		35	5				
		27	3d				
	522	29	3d	A light spot. Drawn from frame 29.	A dark, crater-like formation on a gray background. The bottom differs little from the background. A rim is noticeable. Described from frame 29.	-178°	+33°
		31	8				
		27	3d				
	523	29	3d	A light spot. Drawn from frame 29.	A light, crater-like formation on a gray background. A rim is noticeable. Described from frame 27.	+177°	+11°
		31	8				
		27	3d				
76	527 Sea of Dreams	27	3d	The darkest area near the disc's edge. Outlined from frames 29 and 31.	The Sea of Dreams region. Stands out as a dark, elongated formation on a gray background. In places it is lighter than Mare Smythii and Mare Marginus. Apparently consists of a number of cirques and crater seas, such as the formations 107, 200, 507, etc. Directly tangent to the Sea of Dreams is a light region consisting of formations such as 203, 180, 202, etc. Described from frames 29 and 31.		
		29	9, 64				
		31	9				
		35	10				
76	Tsiolkovskii	26	All photo- metric cross sections. The same. " "	The crater's contour and rim are taken from frame 26. The position from frame 29.	A dark, crater-like formation on a gray background. It has a clearly-pictured, broad rim, which is brighter in the west. There is also a brighter part on the northeast side of the rim. The bottom is inhomogeneous and relatively very dark. There is a clearly visible hill. The section between the hill and the rim to the north is somewhat brighter than the surrounding bottom and forms a hazy arc. There is a dark formation with a light spot on the southwestern part of the rim. Described from frames 26 and 29.	+13°	-22°
		29					
		31					
		27					
		32					

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
152	Moscow Sea	29 31 27 35 26 partly	Almost all photometric cross sections.	The boundaries are taken as follows: The north- ern and eastern parts from frame 29 - 64, the south- ern and western parts from frame 29 - 9.	A dark, sea-like formation with irregular outlines on a bright background. There is a deeper part in the south named Astronaut Bay. The bottom is inhomogeneous being raised in places. There is a bright, hill-like formation approximately in the center. The brightness of the bottom of the Moscow Sea is greater, according to frame 29 - 7, than that of Mare Smythii and Mare Marginus. Described from frames 29 and 31.	+149 <sup>0</sup>	+27 <sup>0</sup>
153	542	31 26 27	13 10 3d	A dark spot. Drawn from frame 31.	A dark formation on a gray background. Possibly a crater. A rim is noticeable. Described from frames 26 and 31.	+138	+40
154	544	26 31 29 35	10 13 10 9	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom differs little from the back- ground. A rim is noticeable. Described from frames 26 and 29.	+134	+27
155	546	36 31 29	4 13 10	A dark spot. Drawn from frames 31 and 36.	A dark, crater-like formation on a gray background. The bottom differs little from the background. A rim is noticeable. Possibly, there is a hill in the center. Described from frames 31 and 39.	+130	+35
156	600	28 32	19, 20, 6 4, 2, 5	A gray spot. Drawn from frame 28.	A gray, crater-like formation on a gray background. It is bordered by a narrow, dark rim, which blends in with crater 462 in the south. The bottom is inhomogeneous. Its position and shape are not clearly noted on existing maps. Described from frame 28.	+88	-33

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
78	601	26	12	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. It is bordered by a rim that is light in the northwest and dark in the south and southeast. The bottom is inhomogeneous with darker parts in the southwest. These are possibly small craters. Described from frame 26 - 12.	+98 <sup>0</sup>	-16 <sup>0</sup>
		32	4				
		31	3				
78	605	26	1, 2, 4, 12	A dark spot. Drawn from frame 26 - 12.	A dark formation on a light background. Possibly is a crater with a discontinuous rim. The bottom is inhomogeneous. The central part of the bottom stands out sharply in intensity. Apparently there is a hill here. The contour is not altogether clear. Described from frame 26 - 12.	+114	-20
		28	6				
		31	3				
		29	10				
78	615	26	10, 11	A dark spot. Drawn from frame 26 - 11.	A dark formation on a gray background - possibly a crater. No rim is noticeable. The bottom is inhomogeneous being darker in the north. There is a lighter part in the center, apparently caused by a hill. Described from frame 26 - 11.	+106	+11
		28	20				
		32					
78	616	26	12, 2, 1	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation on a gray back- ground. Clearly outlined in the north and south. The bottom is dark and approximates that of Mare Smythii in intensity. Possibly there is a hill in the western part. It is not accurately noted on existing maps. Described from frame 26 - 1.	+82	-42
		28	18, 19, 20				

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
161	626	26 32 36 31	11, 10 10, 9, 2 4 13	A gray spot. Drawn from frame 26 - 11.	A gray formation on a lighter background. Circled by a rim, which is dark in the north and northwest and lighter in the east and south. Possibly there is a hill close to the western boundary. Described from frame 26 - 11.	+128°	+25°
162	627	26 28 32 31	11 20 10 3	A bright spot. Drawn from frame 26 - 11.	A bright, round formation on a gray background. No details are noticeable. It is apparently a section of the surface that possesses a large reflection coefficient or a mountain top. Described from frame 26 - 11.	+116	+17
163	628	26 28 32 31	11, 10 20, 23 10 3	A bright spot. Drawn from frames 26 - 11 and 32 - 10.	A bright, round formation on a gray background. No inner details are noticeable. The southern part is brighter. The whole formation is hazier than 699. It is apparently a section of the surface that possesses a large reflection coefficient or a mountain top. Described from frames 26 - 11 and 32 - 10.	+114	+17
164	629	26 32 28	10, 11, 5d 10 6	A dark spot. Drawn from frame 28 - 6.	A dark formation on a gray background. Bounded by a dark, narrow line that broadens only in the southeast. Possibly a crater. Described from frame 28 - 6.	+120	+22
165	631	26 32 36	5d 2 5	A gray spot. Drawn from frame 26 - 5d.	A gray formation on a somewhat lighter, gray background. Outlined by an even-toned gray, narrow rim in the east. Possibly a crater with a bottom that is darker in the east and south. The bottom is lighter in the west. Described from frame 26 - 5d.	+117	+23

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
166	632	26 28 32 36	1, 2, 11, 12d 20 2, 3 4, 5, 6	A gray spot. Drawn from frame 26 - 11.	A gray formation on a light background - possibly a crater whose bottom is inhomogeneous with dark spots in the southeast and southwest. There is a lighter part in the center that looks like a hill. It is bordered on the south and west by a light rim. Described from frame 26 - 11.	+107°	+22°
167	634	26 28 32 31	11 18, 19, 6 2 12	A gray spot. Drawn from frame 26 - 11.	A gray, crater-like formation on a light background. Circled by a narrow, dark rim that slightly broadens in the west. The central part of the crater is clearly lighter than the peripheral parts. Described from frame 26 - 11.	+111	+21
168	635	26 28 32 31	11 20, 6 2, 9, 10 12	A gray spot. Drawn from frame 26 - 11.	A gray formation on a light background - possibly a crater. The western part is lighter. Bordered by a dark, narrow rim. Described from frame 26 - 11.	+112	+22
169	636	26 28 32 31	11 6 8, 10 12	A light spot. Drawn from frame 26 - 11.	A light formation on a light background that is intersected by a ray going from 699. It is confirmed on many frames and is apparently a part of the surface with a large reflection coefficient or a mountain top. Described from frames 26 and 28.	+110	+24
170	637	26 28 32 36	5d 6 10, 8, 2 6	A dark spot. Drawn from frame 32 and 28.	A dark formation, bounded by a dark rim in the west and south, on a gray background. The rim lightens a little in the east. Possibly a crater. Described from frames 26 and 32.	+113	+27

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
171	639	26 28 32	11d 23, 6 10, 2, 3	A gray spot. Drawn from frames 26 and 32.	A gray, crater-like formation on a light back- ground. Bounded by a narrow rim, which broadens and becomes brighter in the southeast. Possibly is a crater which is intersected along its diameter by a bright line, which is apparently a ray going from Giordano Bruno. Described from frames 26 and 32.	+109°	+25°
172	640	26 28 32 36	2, 1, 11d 19 2 3, 1, 2, 4	A gray spot. Drawn from frame 26 - 2.	A gray, crater-like formation, with an inhomo- geneous bottom, on a light background. The bottom is somewhat darker in the north and south. It is intersected along its diameter by a ray going from Giordano Bruno. There is a light spot in the center, possibly caused by a hill. Described from frames 26 - 2 and 32.	+107	+27
173	641	26 28 32	1, 11d 19 10, 9, 2, 3	A gray spot. Drawn from frame 26 - 1.	A gray formation on a light background. A light border is noticeable in the northwest. Possibly a crater. Described from frame 26 - 1.	+102	+32
174	641a	26 29 32	1 2, 10 2	A dark spot. Drawn from frame 26 - 1.	A dark formation on a gray background. It is bordered by a narrow rim in the east and west - possibly it is a crater with an inhomogeneous bottom. The southeastern part is somewhat lighter. Described from frame 26 - 1.	+103	+30
175	642	26 32 28	9, 10 10 18	A light spot. Drawn from frame 26 - 9.	A light formation on a gray background. Bounded by a light rim in the northwest. The rim darkens in the southwest and northeast. Possibly a crater with an inhomogeneous bottom. Described from frame 26 - 9.	+123	+44

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
176	644	26 32 28 27	9, 10d, 5 10 18 3d	A dark spot. Drawn from frame 26 - 9.	A dark formation on a gray background. Possibly a crater whose bottom differs a little from the background. The bottom is lighter in the south. Bounded by a border that is brighter in the west and east. The border darkens in the south. Possibly there is a central hill. Described from frame 26 - 9.	+118°	+35°
177	645 Lomonosov	All frames. Most photometric cross sections.		A dark spot. It is clearly seen on all frames. Drawn from frame 26.	A dark, crater-like formation on a gray background. The bottom is intensely dark, comparable to that of Mare Smythii. It is outlined by a gray rim in the northeast and northwest on frame 26 - 2. The rim becomes unclear in the southeast and southwest. A central hill is noticeable in frames 28 - 21, 32 - 4 and 36 - 1, but is absent in frame 26. Described from frames 26 and 32.	+99	+29
178	646	32 36 26	2, 7, 9, 6 1, 3, 4 1	A dark spot. Drawn from frame 26 - 1.	A dark formation on a gray background. Possibly a crater whose bottom differs little from the background in the southern part. The northern part of the bottom is darker. It is outlined by a dark border in the east and north. Described from frame 26 - 1.	+103	+28
179	647	26 28 32	14d, 6d 19, 21, 6 5, 6, 8	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray background. It is outlined by a hazy, dark rim. Stands out especially clearly in frame 26 - 6d. Apparently coincides with a crater near Timoleon on Wilkins' map. Described from frame 26 - 6d.	+84	+31



Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
180	648 Seneca	26 28 32 36	Auxiliary 6, 19, 20 4, 5, 6, 2 1, 2, 4, 5	A gray spot. Drawn from frame 26.	A gray, crater-like formation with an inhomogeneous bottom that is darker in the southeast on a light background. The northeastern part of the bottom is lighter and differs little from the surface near it. It is bordered by a not-too-clear dark rim, which becomes light in the south. Its position and dimensions closely resemble those of the crater Seneca. Described from frames 26 and 32 - 4.	+82°	+29°
181	649	26 28 32	1, 2, 11, 12, 6d 20, 21, 6, 3 6, 7	A light spot. Drawn from frame 26.	A light, formation on a gray background. It is of bent form and clearly stands out in high cross sections (26 - 6d). It apparently consists of a number of light craters whose coordinates closely match those of craters drawn at this point in Wilkins' map (close to Plutarch). Described from frame 26 - 6d.	+84	+26
182	650	26 32 36	12, 6d, 1 6 6	A gray spot. Drawn from frame 26.	A gray formation, bordered by a light rim, on a light background. Apparently this is a crater with an inhomogeneous bottom that is brighter in the central part. Its coordinates are close to those of a crater shown in the vicinity of Plutarch, but its size is substantially greater. Described from frame 26 - 6d.	+79	+25
183	651 Joliot- - Curie	26 28 32 36	Most photo- metric cross sections. The same.	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray background. The bottom is very inhomogeneous and darker in the east and west, where dark spots are noticeable. There is a lighter area in the center. Possibly this is a hill. Described from frames 26 and 32.	+93	+25

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
184	652	26 36 28 32	1, 2, 11 1, 5, 6 19 6	A dark spot. Drawn from frame 26 - 1.	A dark formation, outlined by a border, on a gray background. Possibly a crater whose bottom is somewhat darker in the southwest. Described from frame 26 - 1.	+96 <sup>0</sup>	+28 <sup>0</sup>
185	653 Maxwell	26 28 32 36	1, 2, 11, 5d 18, 19, 6 2, 3, 7 3, 5, 6	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light background. Bordered by a broad, light rim that narrows in the south. The bottom is lighter in one spot in the east. Described from frames 26 - 5d and 32 - 7.	+99	+30
186	654	26 32 36 28	2, 10d 10, 8, 2 5 19	A light spot. Drawn from frame 26 - 2.	A bright formation on a gray background. Possibly a section having a large reflection coefficient or a mountain top. Described from frame 26 - 10d.	+107	+32
187	655	26 32 36	11, 10 2, 3, 4 5	A light spot. Drawn from frame 26 - 10.	A light crater-like formation on a gray background. It is bordered by a light rim that is brighter in the west. The rim of 655 is tangent to that of 638 in the latter's southeastern part. The bottom differs little from the surrounding ground. Described from frame 26 - 10.	+114	+30
188	657 Liddiard	26	1, 11	A dark spot. Drawn from frame 26 - 1.	A dark, crater-like formation on a gray background. The bottom is shallow and differs little in brightness from the surrounding surface. It is darker in the north. A raised hill-like portion is clearly noticeable in the center, which stands out in brightness. Other small formations are noticeable. Its coordinates closely match those of Liddiard. Described from frame 26 - 1.	+92	+41

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
189	658	26 28 32	10d 3, 6 2, 10, 9, 8	A light spot. Drawn from frame 28 - 6.	A light formation on a gray background - possibly a crater whose bottom is lightest in the southeast. It is bounded by a narrow, dark rim that broadens slightly in the southeast. Described from frame 28 - 6.	+94°	+42°
190	659	26 28 32 36 29 31	Most photo- metric cross sections.	A large, bright region. Drawn from frames 26 and 32.	One of the brightest regions, similar in brightness to the Soviet Range. Its brightest portion is Giordano Bruno (699). There is a group of smaller details within the contour, which, due to their reflective properties, appear to be mountainous formations or small, bright craters. Described from frames 26 and 32.	+103	+37
191	660	26 28 32 36	11 3, 6, 19, 20 2 1, 4, 5	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray background. It is bordered in the north and northeast by a relatively broad, gray rim. The bottom is inhomogeneous. It partly overlaps the crater having coordinates $\lambda = +90^\circ$ and $\phi = 37^\circ$ , which is drawn in the libration zone in Wilkins' map. Described from frame 26 - 11.	+92	+37
192	661	26 32 36 28	2 2, 3 1, 4 20	A dark spot. Drawn from frame 26.	A dark formation, surrounded by a dark rim, on a gray background. The rim is quite narrow in the north and west and is lighter in the south. This is apparently a crater. Described from frame 26.	+92	+31
193	662	26 32 36	1, 2, 11 2, 3, 7 4	A dark spot. Drawn from frame 26 - 1.	A dark formation on a gray background - possibly a crater whose bottom differs little from the surrounding background. It is outlined by a narrow border, which is darkest in the north. Described from frame 26 - 1.	+93	+32

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
194	663	26 28 32	11 20 9, 8, 2, 3	A light spot. Drawn from frame 26.	A light formation on a gray background. Bordered by a narrow rim. Possibly a crater. Described from frame 26 - 11.	+95°	+36°
195	665 Politus	28 32 36	19, 20, 6 2, 3 5, 6	A gray spot. Drawn from frame 28.	A gray formation on a lighter background. A crater with a shallow bottom that differs little in brightness from the surrounding ground. It is bordered by a light rim in the northwest, which becomes dark in the southeast. In coordinates and dimensions it closely resembles Politus shown on Wilkins' map of the libration zone. Drawn from frame 28 - 20.	+88	+48
196	666	26 28 32 36	9, 2, 10d 18, 19, 6, 20 2, 3 6, 5	A dark spot. Drawn from frame 26.	A dark formation on a gray background. Possibly a crater. There is a light spot in the east, which corresponds in brightness to formation 701 in the north. A narrow, dark border is barely visible at its edges. Described from frame 26 - 10.	+102	+56
197	673	26 32	12 2	A gray spot. Drawn from frame 26 - 12.	A gray, crater-like formation on a light back- ground. Bordered by a dark narrow rim that blends in with the surrounding, light surface in the north. The brightness of the bottom is the same as that of the surface to the east. Its coordinates and dimensions coincide with the crater H on Wilkins' map of the libration zone. Described from frame 26 - 12.	+86	+36
198	674	28 26	3 12	A light spot. Drawn from frame 26.	A bright, round formation bordered by a narrow, dark rim, on a light background. Coincides in coordinates and dimensions to crater K on Wilkins' map of the libration zone. Described from frame 26 - 12.	+83	+38

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
199	675 Haloves	26	12	A light spot. Drawn from frame 26.	A light formation on a gray background. Bordered by a dark rim in the southeast and by a thin line in the northwest. The presence of separate, bright formations within the crater is felt. Its coordinates coincide with the Haloves but its size and orientation somewhat differ from those of the latter. Described from frame 26 - 12.	+80°	+44°
200	680	26 32 36	9 10 2	A bright spot. Drawn from frame 26.	A bright formation on a gray background - apparently consisting of separate, small details. In the west it is tangent to the large, very light region 701. The eastern boundary is apparently distorted by disturbances. The contour includes three craters noted on Wilkins' map and having the coordinates +87, +88° longitude, +65, +66° latitude. Described from frame 26 - 9.	+88	+65
201	681	26 28 32	10, 9d 20 3	A light spot. Drawn from frame 26.	A light formation on a gray background - possibly a crater. The brightness of the bottom is the same as that of the surrounding surface. Outlined by a narrow, dark border. Described from frame 26.	+92	+52
202	683	28 36 32 26	6 5 2, 10 10, 9	A light spot. Drawn from frames 32 and 26.	A light formation on a gray background - possibly a crater. It is bounded in the north and west by a narrow, dark rim which broadens in the south and east. The bottom is slightly darker in the northern part of the formation. Described from frame 32 - 3.	+106	+48

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
203	691	26 32 31	10 2, 3, 9 13	A gray spot. Drawn from frame 26.	A gray formation on a light background. Possibly a crater whose bottom differs little from the background. A hazy border is noticeable around the formation. Described from frame 26 - 10.	+132 <sup>0</sup>	+37 <sup>0</sup>
204	692	26 32 36 31	10 10, 3 5, 6 9	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray background. The bottom is inhomogeneous. There is a darker spot in the center. The entire crater is bounded by a rim, which is darker in the southwest than in the north. Possibly there are small craters within the formation. Described from frame 26 - 10.	+130	+31
205	693	26 28 32	10, 9 19 10, 3	A dark spot. Drawn from frame 26.	A dark formation on a gray background. Bounded in the north by a dark rim, which becomes a dark, thin line in the west and south. This is possibly a crater whose bottom is noticeably inhomogeneous. Described from frame 26 - 9.	+116	+38
206	694	26 28 32	10d, 9 18, 19, 6 2, 3	A dark spot. Drawn from frame 26.	A dark formation on a bright background. Possibly a crater whose bottom is somewhat lighter in the west. A dark, narrow rim surrounds the entire formation. The surface, adjacent on the west and north, is much brighter than the bottom. Described from 26 - 10.	+96	+38
207	695	26 28 32	10, 9 18, 19, 23 10, 2, 3	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light background. It is bounded on the east, north and west by a dark rim, beyond which begins a bright region. A bright, hill-like spot is noticeable within the crater at its center. Described from frames 26 - 9, 26 - 10.	+108	+36

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
208	699 Giordano Bruno	26 28 32 36	9, 10d 19, 6 3, 5 Most photo- metric cross sections.	A bright spot in the center of contour 659. Drawn from frame 26.	A bright formation. It may be either a very bright crater having a very large reflection coefficient, or a mountainous region. This is one of the brightest objects on the far side of the moon. It is apparently the center of a ray system. Described from frames 26 - 9, 26 - 10.	+103 <sup>0</sup>	+36 <sup>0</sup>
209	700	26 32 36 28	9, 10 10, 2, 3 4, 6 18	A dark formation. Drawn from frame 26.	A dark formation on a gray background. Possibly a crater with a dark bottom. Surrounded by a rim that is dark in the northwest and lighter in the southeast. The bottom is raised in the south, possibly indicating a hill. Described from frames 26 - 9, 26 - 10.	+118	+45
210	705	28 32	18 3, 2, 6, 7	A light spot at the edge of the disc. The shape and dimensions are taken from 28 and 32.	A light formation on a gray background. Situated near the nocturnal terminator. Looks like the image of a crater obtained during similar phase on photographs taken from the Earth. A section, surrounded by a rim, is clearly seen. The rim is quite wide and is darker in intensity than the surrounding surface. The bottom differs little in brightness from the surrounding background. The entire formation is clearly visible. Described from frame 32.	+120	+88
211	712	26 32	10d 9	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a light back- ground. Its bottom is not too deep and separate, light sections are noticeable in it. It coincides with a crater that is visible from the Earth and has coordinates of +69 <sup>0</sup> latitude, +68 <sup>0</sup> longitude. It is bounded by the surrounding light surface. Described from frame 26 - 10d.	+68	+68

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
212	714 Hahn	26 32 36	14 4 2	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground, bordered by a dark rim in the southeast and southwest. The rim becomes lighter in the northeast and northwest. There is a bright point approximately in the center - apparently a hill. The region adjacent in the east is substantially darker than the region situated beyond the western rim. It coincides with Hahn in coordinates and configuration. Described from frame 26 - 14.	+71 <sup>0</sup>	+32 <sup>0</sup>
213	715 Gauss	26 28 36	12 3 2	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray back- ground. The bottom is inhomogeneous. Separate small formations are noticeable. The contours are hazy. Two small craters are adjacent to it in the north. The crater's length is about twice as large as the width. In coordinates it closely matches Gauss in Wilkins' map. Described from frame 26 - 12.	+78	+37
214	716	26 32 36	69 2 1, 4, 5	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray back- ground. Bordered by a light, narrow rim. In dimensions and coordinates it closely matches a crater shown in Wilkins' map near Timoleon. Described from frame 26 - 6d.	+89	+32
215	725	28 32	18 1, 2, 3	A dark spot. Drawn from frame 32.	A dark, crater-like formation on a gray back- ground. Situated directly next to the nocturnal terminator. The relief of this object is among the best obtained on the photographs of the far side of the Moon. The whole formation is entirely clearly visible. The portion within the rim is darker than the surface of the adjacent continent.	+175	+85



Objects of the first order of certainty

No. n/ n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
215	725				The crater's rim is somewhat darker in the south-east than the surrounding surface, but is substantially lighter than the part within it. Since the AIS was noticeably higher than the lunar equator ( $17^{\circ}$ ) during the moment of photographing, the rim's shadow in the crater was recorded. The rim's upper edge in the northwest (ie closer to the terminator) stands out as a light, bent border, being illuminated by the sun. Described from frame 32.		
216	726	28 32	1, 2 1, 2, 3	A light spot. Drawn from frame 32.	A light formation on a gray background. Situated directly next to the terminator. It is partly hidden by disturbances, and apparently is a crater surrounded by a rim. The inner part of the rim, situated on the northwest, is well-illuminated by the sun. Possibly the rim is of varying heights. The southeastern part of the rim is apparently higher than the neighboring parts and its shadow, cast into the crater, is noticeable. Described from frame 32.	$+169^{\circ}$	$+79^{\circ}$
217	729	28 32	1, 2 1, 2, 3	A light spot. Drawn from frame 32.	A light formation on a gray background. Situated near the terminator. The shape is somewhat distorted by disturbances. It is apparently a crater surrounded by a rim. A dark section is noticeable within the crater - this may be a shadow from the rim. The northwest side of the rim is illuminated by the sun. Described from frame 32.	$+170$	$+77$

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
218	730	26	1, 9	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray background. The bottom is not too deep and differs little from the gray background. It is bordered by a very narrow, light rim. It coincides with a crater seen from the Earth and having the coordinates $\lambda = +79$ and $\phi = +68^\circ$ . Described from frame 26 - 9.	+77 <sup>0</sup>	+68 <sup>0</sup>
219	731	26	1, 9	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray background. Bounded in the west by a light region. The bottom is inhomogeneous and lighter in the southeast. Coincides with a crater that is visible from the Earth and having coordinates of $\lambda = +70$ and $\phi = +66^\circ$ . Described from frame 26 - 9.	+68	+65
220	732	26	1	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray background. It is adjacent to Mare Humboldtianum. Coincides with a crater visible from the Earth and having coordinates of $\lambda = +73$ and $\phi = +63^\circ$ . Described from frame 26 - 1.	+74	+61
221	733	26	1, 14	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray background. The bottom is inhomogeneous and is darker in the center. It is bounded in the southwest by a narrow, dark rim and by a lighter portion of the adjacent surface in the north. In coordinates and dimensions it closely resembles a crater shown on Wilkins' map. Described from frame 26.	+71	+45

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
222	734	26	14, 6d	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray back- ground. Bordered by a hazy, dark rim. In coordi- nates it closely matches a crater shown not far from Seneca in Wilkins' map, but it is somewhat larger than the latter. Described from frame 26 - 6d.	+74 <sup>0</sup>	+29 <sup>0</sup>
223	735 Palitzsch	26	1	A gray spot. Drawn from frame 26.	A gray fromation on a light background - apparently a crater with a deep bottom that is darker in the south. It is bounded by a light rim, which in intensity blends in with the surrounding surface at the north. In coordinates and configuration it coincides with Palitzsch, which is found on Wilkins' map. Described from frame 26 - 1.	+89	+41
224	737 Plutarch	26	1, 6d	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. Bordered by a hazy, light rim that is brighter in the northwest. The bottom is inhomo- geneous and possibly there is a small hill in the center. It stands out clearly in frame 26 - 6d. Even two small craters are noticeable in this frame, situated on the southern rim. In coordinates and dimensions it closely matches Plutarch. Described from frame 26 - 6d.	+80	+26
225	738 Timoleon	26 32	12 2	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. Two small craters are noticeable in the inhomogeneous bottom. In places it is bordered by a discontinuous, dark rim. In coordinates it almost coincides with Timoleon in Wilkins' map. Described from frame 26 - 12.	+85	+34

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
226	739	26 28	2 3	A dark spot. Drawn from frame 28.	A dark, crater-like formation on a gray back- ground. It is directly adjacent to Neper. The bottom is inhomogeneous. Possibly there is a central hill. It blends in with Mare Marginus in the northeast. In position it closely matches a crater shown on Wilkins' map of the peripheral zone. Described from frame 28 - 3.	+87°	+9°
227	740	26 28	1 3	A gray spot. Drawn from frame 28 - 3.	A gray, crater-like formation on a light back- ground. It is bounded by a dark rim that becomes lighter in the west. The bottom is inhomogeneous. Possibly there is a hill. In position and dimensions it closely matches crater P, shown in Wilkins' map (Table XI +981, +110). Described from frame 28 - 3.	+83	+5
228	741	26 28	2 3	A gray spot. Drawn from frame 28.	A gray crater-like formation on a gray back- ground. There is a dark rim around it. The bottom is inhomogeneous and is darker in the northeast. In position and dimensions it closely matches an object shown in Wilkins' map (Table XI -970, +190). Described from frame 28 - 3.	+83	+9
229	742	26 28	20 2	A gray spot. Drawn from frame 28.	A gray formation on a somewhat lighter back- ground. It is bordered by a narrow, dark rim, which becomes light in the southwest. The bottom is not homogeneous and is darker in the northeast. In coordinates and dimensions it closely resembles a crater arbitrarily drawn on Wilkins' map. Described from frame 28 - 20.	+84	-16

Objects of the first order of certainty

No. n/ n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
230	743 Phillips	26	2	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a light back- ground. Bordered by a dark rim in the south- east and northwest and by a narrow, light rim in the northeast and north. The bottom is inhom- ogeneous. Possibly it has a hill. It coincides with Phillips in position and dimensions. Described from frame 26.	+78°	-27°
231	744 Schubert	26 28	2 3	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. It is bordered by a narrow, rim that becomes barely noticeable in the north and north- east. The bottom is inhomogeneous. It possibly contains small craters. In position and dimensions it closely matches Schubert, which is shown in Wilkins' and Neison's maps. Described from frame 26 - 2.	+78	+2
232	745	26	12	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a dark back- ground. Bordered by a dark rim. The bottom is inhomogeneous. There is a lighter part on the rim in the southeast - apparently a small crater. In position and dimensions it closely matches a crater drawn on Neison's and Wilkins' maps. Described from frame 26 - 12.	+76	-18
233	746	26	11	A gray spot. Drawn from frame 26.	A gray formation, which becomes light only in the southeast, on a gray background. Apparently the crater is bordered by a narrow, light rim. The brightness of the bottom is inhomogeneous. It coincides with a crater, having the same coordinates, that is shown in Wilkins' map of the libration zone. Described from frame 26 - 11.	+88	+37

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
234	746a Mare Hum- boldtianum	28  26 31 29	All photo- metric cross sections. The same. " " " "	A dark spot. Drawn from frame 26.	A dark formation on a light background. It is clearly outlined on the northeast, east and south- east. The opposite side is outlined less clearly. The bottom becomes lighter towards the west, gradually approximating the gray background in brightness. A number of craters are noticeable in the bottom. They are darker in the eastern part. As was to be expected, the contour does not coincide with the generally accepted one shown on present maps, especially in the west. Described from frame 26.	+80°	+57°
235	747	26	2	A gray spot. Drawn from frame 26.	A gray, crater-like formation, bordered by a hazy rim, on a light background. The bottom is inhomo- geneous and brighter in the central part. In position and dimensions it matches a crater drawn on Wilkins' map (Table XII). Described from frame 26 - 2.	+78	+22
236	748	26 28	2 3	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray back- ground. The bordering rim is clearer in the west and becomes barely noticeable in the east. It coincides, in position and coordinates, with a crater shown on Wilkins' map (Table XII, object E +91, +35). Described from frame 28 - 3.	+76	+18
237	749	26	2	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a somewhat lighter background. It is bordered by a hazy rim, which is clearer in the northwest. It is tangent to formation 748. In position and dimensions it closely matches a crater shown on Wilkins' map (Table XII). Described from frame 26.	+75	+21

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
238	750	26	2	A gray spot. Drawn from frame 26.	A gray, crater-like formation, bordered by a dark rim, in a gray background. The bottom differs little from the surrounding gray background. In position and dimensions it coincides with a crater on Wilkins' map (Table XII +938, +298). Described from frame 26.	+76°	+17°
239	751	26	2	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a somewhat darker background. A narrow, light rim is noticeable in the southeast but is barely discernible in the northwest. The bottom is inhomogeneous. In position and dimensions it closely matches a crater on Wilkins' map (Table XII +942, +306). Described from frame 26.	+81	+16
240	752	28 26	3 2	A gray spot. Drawn from frame 26.	A gray, crater-like formation, bordered by a narrow rim, on a light background. The bottom is inhomogeneous and darker in the west. In position and dimensions it closely matches crater T on Wilkins' map (Table XI +950, +80). Described from frame 26 - 2.	+74	+5
241	753	26 28	2 3	A gray spot. Drawn from frame 26.	A gray, crater-like formation, bordered by a rim, on a gray background. The bottom is inhomogeneous with dark spots in the north, east and west. There is a hill in the center. In position and dimensions it closely matches a crater shown on Neisons' map, where no central hill is noted, and a crater on Wilkins' map (Table XI +962, -50). Described from frame 26 - 2.	+76	-4

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
242	754	26	2	A gray spot. Drawn from frame 26.	A gray, crater-like formation, bordered by a dark rim, on a gray background. The bottom is inhomogeneous. In position and dimensions it closely matches a crater shown in Neison's map and one shown in Wilkins' map (Table XI +992, -10). Described from frame 26 - 2.	+81 <sup>0</sup>	-1 <sup>0</sup>
243	755	26	2	A dark spot. Drawn from frame 26.	A dark formation on a gray background. Bordered by a narrow, light rim that becomes barely discernible in the north and south. The bottom is inhomogeneous and somewhat darker in the west. There is a hill in the center. It is tangent to crater 756. In position and dimensions it closely matches crater B, shown on Neison's map, and a crater on Wilkins' map. Described from frame 26 - 2.	+81	-3
244	756	26	2	A dark spot. Drawn from frame 26.	A dark formation on a gray background. The bottom differs little from the background. It is surrounded by a hazy, light rim. In position and dimensions it closely matches a crater shown on Neison's map. Described from frame 26.	+79	-3
245	757	26 28	14 3	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray background. It is bounded by a clear, dark rim, which blends in with Mare Smythii in the west. In coordinates and dimensions it closely matches a crater drawn in arbitrarily on Neison's map. Described from frame 26 - 14.	+83	-9



Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
246	758	26 28	14 3	A gray spot. Drawn from frame 26.	A gray, crater-like formation, outlined by a hazy rim, on a gray background. Its northern boundary is tangent to one of the craters in Mare Smythii. In coordinates and dimensions it closely matches a crater, arbitrarily drawn in on Neison's and Wilkins' maps. Described from frame 26 - 14.	+85 <sup>0</sup>	-10 <sup>0</sup>
247	759	26 28	14 3	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light background. Bordered by a narrow, dark rim, which becomes lighter in the southwest and blends in with the surrounding background. The northeast part of the crater protrudes into Mare Smythii. It is not shown in Wilkins' and Neison's maps. Described from frame 26 - 14.	+88	-10
248	760	26	12	A light spot. Drawn from frame 26.	A light, crater-like formation, bordered by a dark rim, on a gray background. The bottom is inhomogeneous and lighter in the southwest. It apparently comprises part of crater E, which is arbitrarily drawn in on Wilkins' map (Table I +960, -270). Described from frame 26.	+87	-14
249	761	26 32	12 2, 10	A bright spot. Drawn from frame 26.	A bright, crater-like formation on a gray background. Bordered by a narrow, dark rim that disappears in the north. In position and dimensions it closely matches a crater drawn on Wilkins' map (Table X +936, -320). Drawn from frame 26 - 12.	+86	-18

Objects of the first order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
250	762 Marinus	26 28	2 20	A gray spot. Drawn from frame 26.	A gray formation on a light background. Bordered by a dark rim in the northwest and southeast. The contour is unclear in the northeast. In position and dimensions it closely matches Marinus. Described from frame 26 - 2.	+77°	-39°
251	763 Hanno	26	1	A dark spot. Drawn from frame 26.	A dark, crater-like formation with a dark bottom on a gray background. In position and dimensions it closely matches Hanno as shown on Wilkins' and Neison's maps. Described from frame 26 - 1.	+75	-54

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
252	103	29 31 35	10 9 9, 10	A light spot. The position is taken from frame 29.	A light formation on a gray background. Possibly a crater whose rim is noticeable in some parts. The intensity of the bottom is homogeneous. Described from frames 29 and 31.	+159°	+24°
253	105	27 29 31 32	4d, 2d 64 9, 10 10	A light spot. Drawn from frame 31.	A white formation on a dark background. Possibly a crater or a part of the surface that has a larger reflection coefficient. No rim is noticeable on the photometric cross sections. Described from frame 29.	+138	+06
254	108	29 31 27	9, 10 10 7d, 6d	A light spot. Drawn from frame 29.	A light, crater-like formation on a gray background. No rim is noticeable and the bottom is homogeneous in intensity. Described from frame 29.	+147	+09
255	109	29 31 27	10, 9, 67 8, 9 3d, 7d, 6d, 2d	A light spot. Position taken from 29. Shape and dimensions taken from frame 27.	A light, crater-like formation on a gray background. No rim is noticeable and the bottom is inhomogeneous in intensity. Described from frame 27 - 3d.	+152	+15
256	110	29 31 35	67 10 10	A light spot. Drawn from frame 31.	A light, elongated, somewhat bent formation on a gray background. No rim is noticeable. The entire formation is homogeneously white. Described from frame 31.	+160	+17
257	111	29 31	10, 64 9, 10	An elongated light spot. Drawn from frame 29.	A white, bent formation on a gray background. No rim is noticeable. The intensity of the formation's surface is homogeneous. Described from frames 29 and 31.	+163	+16

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
258	112	34 31 29 35	8 10 64 9, 10	A dark spot. Position and dimensions taken from frame 31.	A dark formation on a gray background. Possibly a cirque. A rim is noticeable, which is hazier in the south. The bottom is relatively homogeneous. Described from frame 31.	+141 <sup>0</sup>	-41 <sup>0</sup>
259	113	34 31 35 29	8 10 9 64	A dark spot. Position and dimensions taken from frame 31.	A dark formation on a gray background; possibly a crater. The bottom is grayish in places, a rim is noticeable and clearly so in the north. It apparently comprises a crater sea together with formation 112. Described from frame 31.	+139	-47
260	114	29 35 31	10 10, 9 9	A light spot. Drawn from frame 29. The contours are rounded off.	A white, crater-like formation on a gray back- ground. A rim is slightly noticeable. The bottom is homogeneous. Described from frame 29.	+158	+27
261	118	31 35 29 26	9, 12 10 67, 10 10, 11	A light spot. Drawn from frame 31.	A light formation on a gray background. Possibly a crater. A rim is noticeable in places, the bottom is inhomogeneous. The boundaries of the formation are unclear. Described from frame 31.	+151	+38
262	119	31 35 27 29	12 10 7d 67, 10	A light spot. Drawn from frame 29.	A gray formation on a white background. Possibly a crater. A rim is noticeable. The bottom is homogeneous. Described from frames 29 and 31.	+158	+35
263	121	20 31 35	10 8 8	A dark spot. Position taken from frame 29.	A dark formation on a gray background near the edge of the disc. Possibly a crater. Outlines are clear. A rim is noticeable in places and is brighter towards the disc's edge. The bottom is inhomogeneous and an increase in brightness is noticeable in it. Possibly there is a hill. Described from frame 29.	-168	+42

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
264	122	29 35	9 9	A dark spot. Position and contour taken from frame 29.	A dark formation on a gray background on the edge of the disc. It partly continues on into the still unseen portion of the far side of the Moon. It looks like a crater. The bottom is inhomogeneous and a lighter spot is noticeable. This is possibly a hill. A rim is discernible, which appears as a semicircle attached to the disc's edge. Described from frame 29.	-158°	+35°
265	123	29 35 31	10, 67 9 9	A light spot. Position and configuration taken from frame 29.	A white formation on a gray background. Possibly a crater. A rim is noticeable, the bottom is grayish and inhomogeneous. Possibly there is a hill. Described from frames 29 and 31.	+155	+24
266	125	29 31 35	64 12 9	A light spot. Position and dimensions are taken from frame 29.	A light, crater-like formation on a gray back- ground. The rim is barely noticeable, the bottom is inhomogeneous. Described from frames 29 and 31.	+165	+33
267	126	29 31	64, 10, 7d 8	A light spot. Position and dimensions taken frame 29 - 10.	A light, crater-like formation on a gray back- ground. A rim is noticeable and an inhomogeneous bottom. The object's surface differs little from the surrounding background. The southern part of the rim is darker. Described from frame 29.	+167	+32
268	127	29  25	10, 67, 9d, 10d 10	A light spot. Position and dimensions taken from frame 29.	A light, elongated formation on a dark back- ground. Described from frames 29 - 10 and 35.	+168	+24

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
269	129	29 31 32 26	10, 64 9, 10 10 7d	A light spot. Position and dimensions given from frames 29 and 31. It appears on frame 26 near a damaged emulsion.	A dark formation on a gray background. Looks like a cirque. A rim is noticeable. The bottom is inhomogeneous. Described from frame 29 - 10.	+140°	+21°
270	130	29 35 32 26	64 9, 10 10 12	A light spot. Position taken frame 29. It appears at the very edge in frame 26 and 32 near bands of damaged emulsion and disturbances.	A light formation on a gray background. It looks like a crater around which a rim is noticeable. The homogeneous bottom differs little from the surrounding surface. Described from frames 26 and 29 - 10.	+142	+14
271	132	31 35 26	7, 9, 12 10 10	A light spot. Position taken from frame 31.	A white formation on a gray background. It looks like a cirque around which a rim is noticeable. The object's bottom is inhomogeneous and differs little from the surrounding surface. Described from frame 31 - 12.	+141	+25
272	134	29 31 27 35	10 13 3d 10	A dark spot. Position and dimensions taken from frame 31.	A dark formation on a gray background. Possibly a cirque. A rim is barely discernible. In intensity the portion is inhomogeneous and is lighter in the south. Possibly this is a hill. Described from frame 31 - 13.	+146	+17

## Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
273	135	31	9	A light spot. Position and dimensions taken from frames 29 and 34.	A white formation on a gray background. Possibly a crater around which a rim is noticeable. The bottom differs little from the surrounding gray background. Possibly there is a hill. Described from frame 27 - 3d.	+147°	-20°
		29	7				
		34	7				
		27	3d				
274	139	29	10	Two light spots. Position given from frame 29, the shape and dimensions from frame 32.	Two light formations on a gray background. They look like craters. They differ little in intensity from the surrounding background. Described from frame 32.	+134	-01 (north) -03 (south)
		31	9, 10				
		32	3, 10				
275	140	29	10	A light spot. Position and dimensions taken from frames 26 and 29.	A light formation on a gray background. Possibly a crater with a homogeneously light bottom. Described from frames 26 - 10 and 29.	+138	+21
		27	2, 2d				
		35	10				
		26	10				
276	141	31	12, 13	A light spot. Position taken from frame 31. Shape and dimensions from frame 32.	A light formation on a gray background. Possibly a crater around which a rim is noticeable. Described from frames 31 and 32.	+125	-22
		35	10				
		32	8				
		34	8				
277	142	29	64, 10	An elongated dark spot. Shape and dimensions taken from frames 29 and 34.	A dark formation on a gray background. Possibly a crater around which a rim is noticeable. The bottom is inhomogeneous. Described from frame 29 - 10.	+133	-58
		31	9				
		34	7				
		27	3d				

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
278	143	34 32 27	8 9, 10 4d, 6d	A light spot. Drawn from frame 32.	A light round formation on a gray background. Possibly a crater. A rim is noticeable. Described from frames 27 and 32.	+141°	-24°
279	144	31 32 26	3 10, 9 1	A light spot. Drawn from frame 26.	A light formation on a gray background. Possibly a crater. A rim is noticeable. Described from frames 26 and 31.	+133	+18
280	147	31 27 29	8, 13 6d 10	A light spot. Drawn from frames 29 and 31.	A light formation on a gray background. It looks like a crater. The bottom is inhomogeneous in intensity and differs little from the surrounding surface. It is darker in the south. Described from frame 31 - 13.	+136	+13
281	149	31 27 29	10, 12 3d 10	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous and differs little from the background. A rim is discernible. Described from frame 29 - 10.	+141	+09
282	149a	2 31 27	10, 64 10 3d	A dark spot. Position taken from frame 29 - Shape and dimensions from frame 27.	A dark formation on a gray background. Possibly a crater. Described from frame 29.	+145	+13
283	149b	29 27	10 3d	A dark spot. Drawn from frame 29.	A dark, crater-like formation on a gray back- ground. Described from frame 29.	+147	+12



Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
284	149c	29 31 27	10, 64 10 3d	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous and is surrounded by a hazy, discontinuous rim. Described from frame 29.	+144 <sup>0</sup>	+11 <sup>0</sup>
285	150	29 27 31	64 4d 10	A dark spot. Shape and dimensions taken from frame 27. Position taken from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous. There apparently is a central hill. A rim is discernible around the formation and becomes brighter in the northeast. Described from frame 29 - 10.	+149	+11
286	152	29 31 27	10, 64 12 3d	A light spot. Drawn from frame 29.	A white formation on a gray background. It looks like a crater. The bottom differs little from the background. Described from frames 29 - 10 and 31 - 12.	+158	+25
287	153	29 31	64, 10 10, 12	A dark spot. Drawn from frame 29 - 10.	A light, crater-like formation on a gray background. The bottom is inhomogeneous with possibly a hill in the south. A discontinuous rim is noticeable around the formation. Described from frame 29 - 10.	+155	+10
288	155	29 35 31	10 10 9, 13	A dark spot. Drawn from frame 29.	A white formation on a gray background. Possibly a crater. The bottom is inhomogeneous in intensity and differs little from the background. A lighter part is noticeable in the center - possibly a hill. A discontinuous rim is noticeable around the formation. Described from frame 29 - 10.	+161	+21

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
289	155a	31	9	A dark spot. Contour drawn from frame 29 - 10.	A white formation on a gray background. Possibly a crater. A discontinuous rim is discernible around the formation. The bottom is inhomogeneous and differs little from the surrounding background. Described from frame 29 - 10.	+163 <sup>0</sup>	+17
		29	10				
		35	10				
290	158	29	10, 9d	A light spot. Drawn from frame 29 - 9d.	A white formation on a gray background. Possibly a crater around which a rim is discernible. The bottom is inhomogeneous in intensity and is lighter in the center. This may possibly be a hill. Described from frame 29 - 10.	+171	+17
		35	10, 9				
		31	9				
291	159	29	64, 10	A light spot. Drawn from frame 29.	A light, crater-like formation on a gray back- ground. Described from frame 29 - 10.	+177	+17
		31	8				
292	160	29	10	A dark spot near the edge of the disc. Drawn from frame 29.	A dark formation on a gray background - possibly a crater. The bottom differs little from the back- ground. Described from frame 29 - 10.	-173	+15
		31	7				
		27	Most photo- metric cross sections.				
293	162	29	9	A light spot. Drawn from frame 29.	A white formation on a gray background. Possibly a crater. A rim is noticeable. The bottom differs little from the gray background. Described from frame 29 - 9.	+179	+08
		31	8				
294	164	31	8	A light spot. Position and shape taken from frame 29.	A white formation on a gray background. Possibly a portion of the surface having a larger reflection coefficient. Described from frame 35 - 5.	+167	+11
		35	9, 5				
		29	64				

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
295	165	35 29 31	10, 9, 5 64 7	A light spot. Position and shape taken from frame 29.	A light formation on a gray background. Possibly a crater. Described from frames 29 and 35 - 5.	+164 <sup>0</sup>	+12 <sup>0</sup>
296	166	31 35 29	7, 10, 9 9, 10, 5 10	A light spot. Position and shape taken from frame 29.	A light formation on a gray background, noticeable in the form of a bright spot. Described from frame 35 - 5.	+161	+13
297	167	35 31 29	5, 10 13, 10 10	A light spot. Position and shape taken from frame 29.	A light formation on a gray background. Possibly a crater. A rim is noticeable, the bottom is inhomogeneous. Possibly there is a hill. The center of the bottom is darker. Described from frame 35 - 5.	+163	+10
298	168	29 31 35	64 9 9	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom differs little from the gray background. There is a wide rim. Described from frame 29.	+161	+06
299	174	29 31 27	10 9, 10 3d	A dark spot. Position, shape and dimensions taken from frame 29 - 10.	A dark formation on a gray background. Possibly a crater. The inhomogeneous bottom differs little from the gray background. Possibly there is a central hill. A rim is discernible. Described from frame 29 - 10.	+161	+01
300	176	29 31 27	10, 64, 1d 9 3d	A light spot. Position taken from frame 29.	A light formation on a gray background. Possibly a crater whose bottom differs little from the back- ground. A hazy rim is discernible. Described from frames 29 and 31.	+164	-08

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
301	177	29 27 35	10, 64 3d 9	A dark spot. Drawn from frame 31.	A dark formation on a gray background. Possibly a crater whose bottom differs little from the background. Possibly a hill. A hazy rim is noticeable. Described from frames 27 and 29.	+167°	-06°
302	179	29 27 31 35	9, 8 3d 9 9	A dark spot. Drawn from frame 31.	A dark formation on a gray background. It looks like a cirque around which a rim is noticeable. Described from frames 29 and 31.	+175	-18
303	180	29 31 27	8, 9, 1d 7 3d	A dark spot. Drawn from frame 31.	A dark formation on a gray background. Possibly a crater around which a hazy rim is discernible. Described from frames 29 and 31.	+178	-22
304	181	29 31 35	10 9, 10 8	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous and differs little from the surrounding surface. A rim is discernible. Described from frame 29.	+151	-08
305	182	29 31 35 32	10 10, 9 8 9	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous. Possibly there is a hill. Described from frame 29.	+147	-07
306	183	32 31 35	10, 9 10 8	A dark spot. Drawn from frame 32.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous and lighter in the center. Possibly this is a hill. A rim is discernible about the formation. Described from frames 31 and 32.	+138	-01
307	184	29 32 31	9d 9, 10 12	A dark spot. Drawn from frame 32.	A dark formation on a gray background. The bottom is inhomogeneous and bounded by a barely discernible rim. Described from frame 32.	+136	-01

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
308	186	32 29	9, 10 11	A dark spot. Position and dimensions taken from frame 29.	A dark formation on a gray background. It looks like a crater. The bottom is inhomogeneous. Described from frame 32.	+131 <sup>o</sup>	-06 <sup>o</sup>
309	187	29 31 27	10 9 3d	A light spot. Position and dimensions taken from frame 29.	A light formation on a gray background. Possibly a crater or a lighter portion of the surface. Described from frame 29.	+141	-08
310	189	29 35 31 34	10 9, 10 9, 10 7	A dark spot. Drawn from frame 31. Shape and dimensions taken from frame 29.	A dark formation on a gray background. It differs little from the surrounding surface. Described from frame 29.	+148	-29
311	193	29 34 27	10 7 3d	A dark spot. Position and shape given from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous and lighter in places. Possibly there is a hill. A hazy rim is discernible. Described from frame 29.	+131	-28
312	194	29 34 27	11 7 3d	A dark spot. Position and shape taken from frame 29.	A dark formation on a gray background. Possibly a crater. A hazy rim is discernible around the inhomogeneous bottom. Described from frame 29.	+124	-26
313	196	26 29 35 27	11 10 9 3d	A light spot. Position and dimensions taken from frames 26 and 27.	A light, crater-like formation with an inhomogeneous bottom. Described from frame 26.	+119	-34

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
314	201	34 29 35	5, 4, 2 8, 6 9, 10	A dark spot. Position and dimensions taken from frame 29 with reference to frame 34.	A dark formation on a light background. Possibly a cirque around which a rim is discernible. Described from frames 29 and 34.	+167°	-46°
315	202	34 31 27 29	7, 8 10 2d 9	A light spot. Drawn from frame 34.	A white formation on a gray background. Possibly a light portion of the surface. Described from frame 34.	+148	-33
316	204	34 32 27	8 9 2d	A dark spot. Drawn from frame 34.	A dark, round formation on a gray background. Possibly a crater. Described from frame 34.	+138	-29
317	207	34 31 29	7 10 64	A light spot. Drawn from frame 34.	A light formation on a gray background. Possibly a crater around which a rim is discernible. The bottom is inhomogeneous. Described from frame 34.	+132	-41
318	207a	34 27 29 35	7 2d 64 9	A light spot. Drawn from frame 34.	A light formation on a gray background. Possibly a crater around which a hazy rim is discernible. The bottom is inhomogeneous in intensity. Described from frame 34.	+131	-44
319	208	33 27 29	7 3d 9	A gray spot. Drawn from frame 34.	A gray formation on a gray background. Possibly a crater around which a hazy rim is discernible. The formation is not clearly outlined. Described from frame 34.	+127	-43

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
113	209	29	10	A light spot. Drawn from frame 29.	A light formation on a gray background. Possibly a crater around which a rim is discernible. The bottom is inhomogeneous. Described from frame 29.	+126°	-45°
		31	10				
		27	3d				
		34	7				
	212	31	10	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray back- ground. A rim is discernible. Described from frame 31.	+150	-48
		29	64				
113	213	34	7	A light spot. Shape and dimensions taken from frame 29.	A light formation on a gray background. Possibly a crater around which a rim is noticeable. Possibly there is a hill. Described from frame 29.	+144	-39
		31	10				
		27	3d				
	214	31	10	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray back- ground. Described from frame 31.	+152	-47
		29	64				
113	218	29	9	A light spot. Drawn from frame 29. Shape and dimensions taken from frame 34.	A light, crater-like formation on a gray back- ground. A rim is discernible. Possibly there is a hill. Described from frame 34.	+151	-26
		35	9				
		27	3d				
		34	7				
	219	29	7d	A light spot. Position and configuration taken from frame 29.	A light, crater-like formation on a gray back- ground. The bottom is gray. A broad rim is discernible. Described from frame 29 - 7d.	+147	-04
		27	3d				

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
326	220	29 31 27	10, 11 13, 12 2d	A dark spot. Position and dimensions taken from frame 29.	A dark formation on a gray background. Possibly a crater. The bottom is homogeneous, a rim is discernible. Described from frame 29 - 10.	+132°	-03°
327	221	29 35 34	64 9 8	A dark spot. Position and dimensions taken from frame 29.	A dark formation on a gray background. Possibly a crater. Described from frame 29 - 64.	+132	-17
328	224	34 31	7 13	A dark spot. Drawn from frame 34.	A dark, elongated formation on a gray back- ground. It looks like a crater. The intensity of the bottom is inhomogeneous. A rim is discernible. Described from frame 31 - 13.	+138	-33
329	225	27 29 32 34	3d 10 9 8	A dark spot. Drawn from frame 27.	A gray, crater-like formation on a lighter-gray background. A rim is discernible. The bottom is inhomogeneous and lighter in places. Possibly there is a hill. Described from frame 27.	+139	-12
330	226	32 29 27 31	9 9d 3d 9	A dark spot. Position and dimensions taken from frame 31.	A dark crater-like formation on a gray back- ground. A rim is discernible. Described from frame 31.	+136	-13
331	227	32 29 27	9 9 3d	A gray spot. Position and dimensions taken from frame 32.	A dark formation on a gray background. Possibly a crater. The bottom is inhomogeneous and a rim is discernible. Described from frame 32.	+137	-18



Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
332	229	34 29 31	7 9 12	A light spot. Drawn from frame 34.	A light formation on a gray background. Possibly a crater. The bottom differs little from the background. A rim is discernible. Described from frames 29 and 34.	+158	-41
333	231	34 29 31	8 9 8	A light spot. Position taken from frame 29.	A light formation on a gray background. Possibly a crater. A rim is discernible. Possibly there is a central hill. Described from frames 29 and 31.	+162	-34
334	232	32 29 26	9, 3 10 11, 5d	A light spot. Position is taken from frame 29.	A light formation on a gray background. A border is noticeable. Possibly it is a light spot on the surface. Described from frame 29.	+132	+09
335	233	34 32 27	7 8 3d	A dark spot. Drawn from frame 34.	A dark formation on a gray background. Possibly a crater. A hazy, discontinuous rim is noticeable. Described from frames 32 and 34.	+128	-36
336	236	26 34	11 7	A light spot. Drawn from frame 26.	A light, hill-top-like formation on a gray background. Described from frame 26.	+120	-44
337	329	26 32	11, 1 4, 2	A light spot. Drawn from frame 26 - 11.	A light, crater-like formation on a gray background. Bordered by a broad, dark rim. The rim differs little from the bottom in brightness. The bottom is lighter in the west. It partly coincides with a crater shown on Wilkins' map. Described from frame 26 - 11.	+93	-12
338	342	26 28	11 19	A light region. Drawn from frame 28.	A light, arc-shaped formation on a gray background. The boundaries are not clear. The object stands out due to its brightness. Bright formations are individually evident within the formation - these are possibly small craters. Described from frame 28 - 19.	+99	-08

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
339	343	26 28	12, 0 19	A light spot. Position and shape taken from frame 26.	A light, crater-like formation on a gray back- ground. The bottom is bordered by a dark outline and differs little from the surrounding surface. Coincides with a crater shown on Wilkins' map. Described from frame 26 - 0.	+92	-08
340	346	26 28 36	2, 12, 14, 4 18 1, 3, 4, 5, 6	A gray spot. Shape and dimensions taken from frame 26.	A gray region on a light background, which is situated in the northwest of Mare Smythii. The bottom is somewhat darker than the surrounding surface. Inside the contour are noticeable two portions that correspond in brightness to the surrounding surface. Described from frame 26 - 2.	+96	+04
341	347	26 28 36	2, 12, 14, 4 6, 23, 21 1, 3, 4, 5, 6	A gray spot. Drawn from frame 26.	A gray formation on a light background. Possibly a crater. The bottom is inhomogeneous and some- what brighter in the northeast. Described from frame 26 - 2.	+103	+07
342	348	26 28	12, 3d 19	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. Bordered by a light rim in the west and southwest, which disappears in the east and north- east. The bottom is inhomogeneous, and lighter in the west. Described from frames 26 - 12 and 26 - 3d.	+103	-03
343	351	26 28 32 36	1 18, 19, 6 4 1, 3, 5, 6, 4	A dark spot. Position taken from frame 28.	A dark, crater-like formation on a gray back- ground. Bordered by a narrow rim. It is clearly outlined by the surrounding background. The intensity of the bottom is homogeneous. Described from frame 26.	+104	-13

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
344	353	28 26	19 0	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray back- ground. Bordered by a dark rim. The bottom differs little from the surrounding background. Coincides with a crater shown on Wilkins' map of the libration zone. Described from frame 26 - 0.	+93°	-08°
345	356	26 28	12, 11, 0 18	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. Bordered by a light section in the south. A dark, narrow rim is noticeable. Coincides with a crater shown on Wilkins' map. Described from frame 26.	+90	-10
346	357	32 36 26	4 3 11	A dark spot. Drawn from frame 26.	A dark formation on a gray background. Possibly a crater. Gray sections border the formation from the east and north. In the south and west the adjacent ground differs little from the dark bottom. The bottom is somewhat lighter in the north. Described from frame 26 - 11.	+102	-07
347	359	26 32	0 4, 2	A gray spot. Drawn from frame 26.	A gray crater-like formation on a gray background. Bordered by a narrow rim. Described from frame 26.	+93	-10
348	370	26 28	2, 1 20, 6, 3	A dark spot. Position and dimensions taken from frame 26 - 1.	A dark crater-like formation on a gray background. Bordered in the west by a light, narrow rim which becomes a dark line in the southeast. The bottom is darker than the surrounding surface. It is directly adjacent to Mare Marginus. Possibly is the latter's continuation. Described from frame 26 - 2.	+97	+12

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
349	370a	26 28	2 3	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray back- ground. Bordered in the north by a narrow light rim. Described from frame 26 - 2.	+98 <sup>0</sup>	+11 <sup>0</sup>
350	370b	26 28	2 3	A gray spot. Position taken from frame 26.	A gray, crater-like formation on a light back- ground. The bottom differs little from the surrounding gray surface and is lighter in the north. The rim is lighter in the east and appears like a narrow dark strip elsewhere. Described from frame 26 - 2.	+99	+10
351	379	26 32 36	12 5, 6, 7 1	A light spot. Drawn from frame 26.	A bright, light formation on a gray background. Possibly a mountain top. Described from frame 26.	+97	+25
352	390	26 28	1, 12, 11 21, 6	A gray spot. Position and dimensions taken from frame 26.	A gray crater-like formation on a light back- ground. The bottom is homogeneously gray. A light rim is noticeable along the contour, and becomes unclear in the north. Described from frame 26.	+114	+02
353	394	26 28	11 3	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. In the west and northwest it is bordered by light sections. The bottom is inhomogeneous and a hill is noticeable. Described from frame 26 - 11.	+106	-09
354	395	28 32 36	19, 6 4 3, 4, 5	A dark spot. Position and configuration taken from frame 28.	A dark formation on a gray background. Possibly a crater. Partially surrounded by a rim that blends in with the background in the northeast. The bottom is inhomogeneous. The configuration is not clear. Described from frame 28 - 19.	+107	-13

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
355	397	26 28	11 19	A light spot. Position and dimensions taken from frame 26.	A light, crater-like formation on a gray back- ground. Bordered by a hazy, dark rim. The bottom is homogeneously light. Described from frame 26 - 11.	+115°	-10°
356	398	26 28	11, 12 21	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. Bounded in the southeast by a hazy light rim and in the northwest by the light ground of the Soviet Range. Described from frame 26 - 11.	+118	-11
357	400	32 36 26	2 6 1	A light spot. Drawn from frame 26.	A light, round formation, bordered by a dark line and tangent to the rim of formation 388. Described from frame 26 - 1.	+109	+18
358	401	26 32	1, 2 10	A light spot. Position and dimensions taken from frame 26.	A light, crater-like formation on a gray back- ground. The bottom differs little from the gray background. Bordered by a narrow line. Described from frame 26 - 1.	+108	+17
359	402	26 32	11, 1 5	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray back- ground. Bordered by a dark band. The bottom is lighter in the center. Possibly this is a hill. Described from frame 26 - 1.	+104	+08
360	403	26 28	11, 10 19	A dark spot. Position and shape taken from frame 26.	A dark, crater-like formation on a gray back- ground. Bordered by a narrow rim that is dark in the northeast and lighter in the southwest. The bottom is inhomogeneous and darker in the north. Described from frame 26 - 10.	+106	-05

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
361	406	26 32	11, 12, 1 5, 3	A dark spot. Shape and position taken from frame 32.	A dark, crater-like formation on a gray back- ground. Outlined by a hazy rim. The homogeneous bottom differs very little from the surrounding surface. Described from frame 32 - 3.	+122 <sup>0</sup>	-21 <sup>0</sup>
362	407	26 32 36	10, 11, 12 5, 6, 2, 7	A light spot. Drawn from frame 32.	A light, elongated formation on a gray back- ground. The contour is not clear. Consists of separate bright formations. Possibly a hilly section. Described from frame 32 - 2.	+119	-22
363	416	26 32 36	10d 3, 2, 9	A gray spot. Drawn from frame 26.	A gray formation on a light background. Possibly a crater. Bordered by a dark, narrow band on the northwest and southwest. The bottom is very inhomogeneous. A light band passes through the northeast part, possibly consisting of several light areas. Described from frame 26 - 10.	+116	+03
364	418a	26 32 28	2 trial 1 19	A gray spot. Drawn from frame 26.	A gray formation on a lighter background. The bottom differs little from the surrounding back- ground. A narrow, dark rim is discernible. Described from frame 26.	+118	+12
365	423	26 32 36	10, 11 10, 9 1, 5	A light spot. Position and shape taken from frame 26.	A light formation on a gray background. Possibly a crater. The northern part of the bottom stands out due to its brightness. This is possibly a hill. The southwestern and southeastern parts of the bottom are darker. A dark rim is noticeable in the south- east. Described from frame 26 - 10.	+123	+06
366	426	26 32	11, 1 10, 2	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray back- ground. A rim is discernible. Possibly there is a hill. Described from frame 26 - 11.	+130	+10

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
367	427	26 32 36	11 10, 9 1, 2	A dark spot. Drawn from frame 26.	A dark-gray formation on a gray background. The former differs little in intensity from the crater. It is possibly an indentation of the surface. Situated directly adjacent to formation 185. Described from frame 26 - 11.	+127°	+06°
368	428	26 32 31	5d 2 12	A bright spot. Dimensions and shape taken from frame 26.	A bright, crater-like formation on a light background. The bottom differs little from the background and a rim is discernible. Described from frame 26 - 5d.	+128	-07
369	432	26 32 36	9 10 6	A light spot. Shape, position and dimensions taken from frame 26.	A light formation on a gray background. Possibly a crater. The bottom darkens in the south. Described from frame 26 - 9.	+124	+03
370	440	26 28	11, 12 18	A gray spot. Drawn from frame 28.	A gray formation on a dark background. Possibly a crater with an inhomogeneous bottom that differs little in brightness from the background. Bounded by a light rim that is brighter in the west. Possibly there is a hill in the center. It is not noted on maps of the libration zone. Described from frame 28 - 18.	+96	-23
371	467	26 32	12, 2 1, 4	A gray spot. Position and dimensions taken from frame 26.	A gray, crater-like formation on a dark background and bordered by a light rim. The bottom differs little from the surrounding ground, but is lighter than that of 491. Its position and dimensions are inaccurate on existing maps. Described from frame 26 - 2.	+83	-45

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
372	468	26 28 32 36	12, 14 18, 20, 6 5 5	A dark spot. Configuration and dimensions taken from frame 26.	A dark formation on a gray background. The contour is not clear. The surface is inhomogeneous in intensity. The darker areas are situated in the south, while towards the north the surface's intensity gradually grays. It apparently consists of a number of small, crater-like formations. In intensity it approximates Mare Australe. Possibly is a "swamp-like" area. Described from frame 26 - 12.	+107°	-27°
373	469	26 36 28	12, 11 1, 5, 6 20	A dark spot. Drawn from frame 26.	A dark formation on a gray background. The boundaries are not clear. The bottom is inhomogeneous - in brightness it is darker in the south and lighter in the north. Possibly there are separate, small craters. It is somewhat lighter in intensity than object 468 and Mare Australe. Looks like a "swamp" in brightness. Described from frame 26 - 11 and 26 - 12.	+114	-30
374	476	28 32 36	19 4 6	A dark spot. Drawn from frame 28.	A dark formation on a gray background. Possibly a crater. Bounded by a hazy, discontinuous rim. The bottom differs little in intensity from the surrounding ground. Described from frame 28 - 19.	+108	-15
375	478	28 32 36	18, 19 4 1, 5, 3, 6	A dark spot. Drawn from frame 28.	A dark formation on a gray background. Possibly a crater. Outlined by a discontinuous light rim. The intensity of the bottom is inhomogeneous. Described from frame 28 - 19.	+105	-14
376	483	26 28	1, 2, 11, 12 18, 19	A dark spot. Drawn from frame 26.	A dark, crater-like formation with a dark bottom on a light background. A light rim is discernible. Described from frame 26 - 12.	+97	-44



Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
377	484	26 28	12, 11 18, 19	A dark-gray spot. Dimensions and position taken from frame 26.	A dark formation on a gray background, situated in Mare Australe on its southern boundary. It possibly consists of a number of small dark craters. Described from frame 26 - 12.	+103°	-45°
378	489	26 28	11, 2, 12 18	A dark spot. Drawn from frame 26.	A dark, crater-like formation with dark bottom on a gray background. Borders 607. Described from frame 26 - 2.	+107	-42
379	491	26 32 36	12 5 4, 5, 6	A dark spot. Drawn from frame 26.	A gray formation on a light background. Possibly a crater. A light, broad rim is noticeable in the north. It becomes barely noticeable in the south. The bottom is inhomogeneous. Described from frame 26 - 12.	+108	-36
380	495	26 36 32 31	2, 4, 12, 11 4 6, 4 10	A dark spot. Position and dimensions taken from frame 26.	A dark, crater-like formation with a dark bottom on a gray background. The inhomogeneous intensity of the bottom is noticeable. Described from frame 26 - 2.	+100	-39
381	501	34 29 27	3, 13 10 3d	A dark spot. Position and dimensions taken from frame 29.	A dark formation on a gray background. Possibly a crater. A partly discontinuous rim is discernible. The outlines are not clear. Described from frame 29.	+154	-04
382	504	31 29 35 27	3 10 5 3d	A dark spot. Drawn from frame 29.	A dark, crater-like formation on a gray back- ground. The bottom differs little from the back- ground. A partly discontinuous border is discernible. The contour is not clear. Described from frame 29.	+158	-17

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
383	524	31 35 26	3 7 9	A dark spot. Drawn from frame 31.	A gray formation on a light background. Possibly a crater whose rim is discernible. Described from frame 31.	+150°	+47°
384	528	29 31	9, 64 9	A dark area at the edge of the disc.	A region, possessing low reflecting capacity, situated in the equatorial zone above the Sea of Dreams. It is noticeable as a dark formation on a gray background. There is a crater-like formation on it. The outlines are quite hazy. Described from frames 29 and 31.		
385	529	29 31	9, 64 9	A dark area at the edge of the disc.	This region, situated along the disc's edge is noticeable as a dark formation on a gray background. Possibly consists of a number of areas of low brightness. It is bounded by a lighter area on the Moscow Sea side. The outlines are hazy. Described from frames 29 and 31.		
386	530	29 31	9, 64 9	A dark area at the edge of the disc.	A region situated along the edge of the disc. Noticeable as a dark formation on a gray back- ground. Possibly consists of a number of formations possessing a smaller reflection coefficient. It is bounded by a region of greater reflecting ability on the Moscow Sea side. The outlines are not clear. Described from frames 29 and 31.		
387	531	31 29 27 26	13 9d 3d 10	A dark spot. Drawn from frame 29.	An elongated dark formation on a gray back- ground. It looks like a crater whose bottom is inhomogeneous and whose discontinuous rim is discernible. Described from frame 29.	+157	+44

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
388	533	29 27 31	9d 3d 12	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. There is a dark rim in the southwest that gradually blends in with the background. Possibly there is a central hill. Described from frame 29.	+166°	+42°
389	536	29 27 31	10d 3d 12	A light spot. Drawn from frame 29.	A light formation on a gray background. Possibly a crater. A discontinuous hazy rim is noticeable. Described from frame 29.	+173	+47
390	541	31 29	13, 12 10	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray background. The bottom differs little from the background. A hazy rim is discernible. Described from frame 31.	+146	+38
391	543	31 26 27	13 10 3d	A light spot. Drawn from frame 31.	A light formation on a gray background. Possibly a crater whose bottom differs little from the gray background. A hazy discontinuous rim is discernible. Described from frame 31.	+138	+32
392	545	27 32 31	3d 1, 3 12	A dark spot. Drawn from frame 31.	A gray crater-like formation on a gray background. The bottom differs little from the background. A discontinuous hazy border is discernible. Described from frame 31.	+129	+42
393	547	26 27 35 29	4 3d 9 2	A gray spot. Drawn from frame 26.	A gray formation that barely stands out from the gray background. Possibly a crater. In separate places a rim is discernible. The bottom is inhomogeneous and differs little from the background. Described from frames 26 and 27.	+127	+18
394	548	29 32 27	9d 10, 3 3d	A light spot. Drawn from frame 29.	A light formation on a gray background. Possibly a crater. The bottom differs little from the background. A rim is discernible. Described from frame 29 - 9d.	+134	+17

Objects of the second order of certainty

No. n/ n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
395	550	26 32 29	11 2 67	A light spot. Drawn from frame 26.	A light formation. Possibly a light portion of the surface. No rim is noticeable. Described from frame 26 - 11.	+128°	+12°
396	551	29 26 35	11, 2 5d 9	A dark spot. Drawn from frame 26.	A gray, crater-like formation on a light background. The bottom differs little from the background. A hazy discontinuous rim is discernible. Described from frame 26 - 5d.	+128	00
397	552	26 31 29	5d 12 11, 2	A light spot. Drawn from frame 26.	A light formation on a gray background. Possibly a light part of the surface or a crater that differs little from the surrounding ground. Described from frame 26.	+127	-03
398	554	27 32 29 31	3d 8, 3 2 13	A dark spot. Drawn from frame 27.	A dark formation on a gray background. Possibly a crater with a discernible rim. The bottom is inhomogeneous and differs little from the surrounding background. Described from frames 27 and 32.	+124	-24
399	555	29 34 26	10, 2 7 12	A light spot. Drawn from frame 29.	A light formation on a gray background. Possibly a crater. Described from frame 29.	+127	-54
400	556	29 27 31	10 3d 9	A dark spot. Drawn from frame 27.	A dark formation on a gray background. Possibly a crater. Outlined by a narrow, light rim. The bottom is inhomogeneous and darker in the south. A hill is noticeable in the north. Described from frame 27 - 3d.	+155	+14
401	557	29 31	2 13	A light spot. Drawn from frame 29.	A light, crater-like formation on a gray background. Outlined by a rim that is darker in the northeast and lighter in the northwest. Described from frame 29 - 2.	+143	+27

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
402	604	32	6	A gray spot. Drawn from frame 26.	A gray, not clearly outlined formation on a light background. A light rim is discernible in the west. Possibly this is a crater-like formation. Described from frame 26 - 12.	+114°	-24°
		26	12				
		28	20				
		36	6				
403	607	26	11, 12	A gray spot. Position and dimensions taken from frame 26.	A gray formation on a light background. Possibly a crater with a bottom of inhomogeneous intensity. Situated on the boundary of Mare Australe. It is bounded in the northwest by a light part of the surface adjacent to the Mare. In the southeast it borders the crater 489. Described from frame 26 - 12.	+108	-40
		28	18				
		36	6				
404	613	26	12, 11	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a light background. It is bounded in the south and southeast by a broad, bright region and by a dark, narrow rim in the west and north. The bottom is somewhat darker in the southwest part. Described from frame 26 - 12.	+96	-10
		32	4				
405	619	26	1, 2, 11, 12	A dark spot. Position is given from frame 26.	A dark formation on a light background. It looks like a deep crater. A light rim is discernible. Described from frame 26 - 1.	+120	-13
		32	2				
406	624	26	10d, 9d	A light spot. Position and dimensions taken from frame 26.	A light formation on a gray background, bordered by a dark line in the southeast. Differs little in brightness from the surrounding background. Described from frame 26 - 9.	+124	-07
		32	2				
407	625	26	9, 10d	A light spot. Drawn from frame 26.	A light, round formation on a gray background. It is somewhat brighter than the surrounding ground. It is the southernmost area of a large bright region, which continues 414. Described from frame 26 - 9.	+124	-09

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
408	630	36 26 32	1 5d 10, 9	A dark spot. Drawn from frame 26 - 5d.	A dark formation on a gray background. Possibly a crater. The bottom differs little from the background. It is outlined by a dark rim. The bottom is lighter in the center. Described from frame 26 - 5d.	+124 <sup>0</sup>	+24 <sup>0</sup>
409	638	26 32	10, 11 10. 9	A dark spot. Position, shape and dimensions taken from frame 26.	A dark, crater-like formation on a gray background. Bounded on the west by a narrow, dark line and on the east by a gray rim-like border. The bottom is lighter in the north and darker in the southeast. Described from frame 26.	+113	+32
410	643	26 32	10, 11, 5d 10	A dark spot. Drawn from frame 26.	A dark formation on a gray background. Bounded by a light region in the west. Described from frame 26 - 5d.	+115	+24
411	656	28 32 26	6 4 5d	A gray spot. Drawn from frame 26.	A gray formation on a gray background. Possibly a crater whose bottom differs little from the background. Bounded in the west and south by a somewhat lighter rim. The rim becomes a dark line in the north and northeast. Described from frame 28 - 6.	+116	+28
412	664	28 32 36	20 8 3	A gray spot. Position, shape and dimensions taken from frame 28.	A gray, crater-like formation on a gray background. Bordered by a dark rim. The bottom is inhomogeneous and differs little in brightness from the background. The surrounding rim is lighter in the west. No detail having the coordinates of this formation is noted in the area in Nelson's map, while a hazy formation of similar configuration is shown in Wilkins' map. Described from frame 28 - 20.	+82	+48

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
413	682	26 32	9 10, 2, 3	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. The bottom differs little from the surrounding ground. A narrow, dark rim is sensed. Described from frame 26.	+99°	+49°
414	682a	26 32	9 2	A light spot. Position and dimensions taken from frame 26.	A light formation on a somewhat darker background. Bounded by a light surface. There is no rim. It is tangent to the dark formation 682. Described from frame 26 - 9.	+99	+50
415	684	28 32	20, 23, 6 2	A light spot. Drawn from frame 32.	A bright, crater-like formation on a light back- ground. A dark rim is sensed in the south, which becomes narrower in the west. Described from frame 32.	+102	+44
416	685	28 26	18, 19, 20 4	A gray spot. Position and shape taken from frame 28.	A gray, crater-like formation on a lighter back- ground. Bounded by a bright rim in the northwest, which gradually blends in with the background. Described from frame 28.	+99	+42
417	686	26 32	Auxiliary 10	A light spot. Position and dimensions taken from frame 26.	A light, crater-like formation on a gray back- ground. The bottom is noticeably lighter than the surrounding surface. A rim is barely noticeable as a dark line. Described from frame 26.	+114	+57
418	687	26 28 32	10, 9d 18 10, 2, 3	A dark spot. Drawn from frame 26 and 32.	A dark formation on a gray background. Possibly a cirque. The bottom is dark. The bottom rises, possibly, in the north - two lighter areas are observed there. A slight increase of brightness is also noticeable in the south. Described from frame 26 - 10.	+117	+53

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
419	688	26 32	Auxiliary 10, 2, 3	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray back- ground. The bottom is lighter in the north and bordered by a hazy, dark rim. Described from frame 26.	+112°	+53°
420	689	26 32	9 10, 2, 3	A bright spot. Position and dimensions taken from frame 26.	A bright formation on a light background. Bounded by a dark line. Described from frames 26 and 32.	+111	+58
421	690	26 32	9, 10 10, 2	A light spot. Drawn from frame 26.	A bright formation on a light background. Possibly a light area of a continent or a mountainous raised area. The contour is discernible in the form of a narrow, dark line. Described from frame 26.	+132	+54
422	697	26 32	Auxiliary 10, 9	A light spot. Drawn from frame 26.	A light, crater-like formation on a gray back- ground. The bottom stands out sharply due to its brightness in the south. (The area is indicated by a dotted line). The entire formation is bordered by a narrow, rim-like line. Described from frame 26.	+112	+35
423	698	26 32 36	10, 9d 10 7	A dark spot. Drawn from frame 32.	A dark formation on a gray background. Possibly a crater, bounded in the south by a light rim. The bottom is relatively dark. Possibly there is a central hill. Described from frame 26 - 10.	+119	+41
424	700a	28 26	18 9	A gray spot. Drawn from frame 28.	A gray, crater-like formation on a lighter back- ground. It is bordered by a light rim in the north- east and by a narrow dark line in the southwest. Described from frames 26 and 28.	+114	+48



Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
425	701	26	9	A light spot. Drawn from frame 26.	A light formation on a gray background. Possibly consisting of a group of craters. Described from frame 26 - 9.	+100°	+63°
		28	20				
		32	10, 2				
426	702	26	10	A light spot. Position and dimensions taken from frame 28.	A light, crater-like formation on a gray back- ground. Bordered by a dark rim that blends in with the surrounding surface in the northwest. Described from frame 28 - 6.	+75	+63
		28	6				
		32	3				
		36	2				
427	706	28	3	A light spot. Position and dimensions taken from frame 32.	A light formation bordered by a dark rim in the west and north. The rest of the rim is lighter, but still darker than the formation itself or the surrounding surface. Described from frame 32.	+127	+78
		32	8				
428	708	26	Auxiliary	A gray spot. Position, dimen- sions and shape taken from frame 28.	A gray formation on a lighter background. Possibly a crater. A dark rim is discernible in the north. In the south it is unclear. Described from frame 26.	+120	+58
		28	18				
		32	2				
429	709	26	9d	A dark spot. Position, dimen- sions and shape taken from frame 26.	A dark, crater-like formation on a gray back- ground. Bounded in the northwest by a dark rim, which is barely discernible in the southeast. The bottom differs little from the surrounding ground. Described from frame 26.	+124	+52
		32	10, 2				
430	710	26	9d	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a lighter back- ground. A rim is discernible, which is darker in the west than the surrounding surface. Described from frame 26.	+122	+55
		32	2, 3, 10				

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
431	711	26 32	Auxiliary 2, 3, 10	A dark spot. Position and dimensions taken from frame 26.	A dark, crater-like formation on a gray back- ground. The bottom differs little from the back- ground. A rim of ununiform intensity is discernible and is darker in the southeast. The bottom is darker in the northwest. Described from frame 26.	+127°	+56°
432	717	26 32	10, 5d 10, 2	A light spot on a gray background. Position, dimen- sions and shape taken from frame 26.	A light formation on a gray background, bordered in the south and east by a dark line. Looks like a mountain top. Described from frame 26.	+115	+33
433	718	26 32	5d 9, 10, 2, 3	A dark spot on a gray background. Position and dimensions taken from frame 26.	A dark formation on a gray background. It is tangent to region 719 and bounded in the east by a light rim. Possibly a crater. Described from frame 26.	+119	+28
434	719	26 32	10d, 5d 10, 2, 3	A large, light contour. Drawn from frame 26.	A light formation that stands out due to its bright- ness. It is apparently a raised area consisting of separate, bright formations. Described from frames 26 and 32 - 3.	+121	+31
435	719a	26 32	10, 5d 2, 3	A light spot within contour 719. Drawn from frame 32 - 3.	A light formation. It is darker in the south and bounded by a narrow, dark rim. Part of formation 719.	+122	+34
436	719b	26 32	10, 5d 2, 3	A light spot. Drawn from frame 32 - 3.	A light formation, bordered in the west by a dark rim and by a narrow, dark line in the east. Part of formation 719.	+121	+32

Objects of the second order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
437	719c	26 32	10, 5d 2, 3	A light spot. Drawn from frame 32 - 3.	A light, round formation bounded in the northeast and southwest by dark lines. Part of formation 719.	+118°	+31°
438	719d	26 32	10, 5d 2, 3	A light spot. Drawn from frame 32 - 3.	A light formation bounded by a narrow dark line in the northeast and west. The formation is darker in the southeast while the rim is lighter. Part of formation 719.	+120	+30
439	719e	26 32	10, ed 2, 3	A light spot. Drawn from frame 32 - 3.	A light formation, bordered by a light rim in the northeast. The bottom is inhomogeneous. Part of formation 719.	+123	+28
440	727	32	1, 2, 3	A dark spot near the edge of the disc. Drawn from 32.	A crater-like formation with a dark bottom. Situated near the north pole. There is a rim that is light in the north. Described from frame 32.	+85	+85
441	728	32	1, 2, 3	A dark spot near the edge of the disc. Drawn from frame 32.	A crater-like formation surrounded by a relatively narrow light rim. Situated near the north pole. The bottom differs little from the surrounding surface. Described from frame 32.	+100	+83

Objects of the third order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
442	117	31 35 27	8, 13 10 4d	A light spot. Drawn from frame 31. Dimensions and configuration taken from frame 27.	A light formation on a gray background. Possibly a crater. A rim is slightly noticeable, the bottom is uniform, the difference between the surrounding surface and the crater is small. Described from frame 31.	+150 <sup>0</sup>	+40 <sup>0</sup>
443	120	31 35 29	12 9, 10 10	A dark spot. Drawn from frame frames 29 and 31.	A dark formation on a gray background. Possibly a crater. There is a rim, the bottom differs little from the surrounding background. Described from frame 29.	+161	+38
444	133	31 35 29 27	9 10 10 3d	A light spot. Position taken from frame 31. Shape and dimen- sions taken from frames 27 and 29.	A white, crater-like formation on a gray back- ground. A rim is slightly noticeable. The bottom is inhomogeneous and differs little from the gray background. Described from frame 29 - 10.	+144	+21
445	135a	34 29 27	7 2 3d	A gray spot. Position and dimensions taken from frame 29.	A white formation on a gray background. Possibly a crater. The bottom differs little from the surrounding gray background. A rim is noticeable. Described from frame 27 - 3d.	+142	-21
446	136	29 31 27	9 9 3d	A light spot. Position and dimensions taken from frame 27.	A light formation on a gray background. (Almost gray on gray). Possibly a crater. A rim is noticeable. Possibly there is a hill. Described from frame 31 - 12.	+165	+07
447	148	31 27	13 3d, 2d	A light spot. Drawn from frame 31 - 13.	A light, crater-like formation on a gray back- ground. A rim is noticeable, the bottom is inhomo- geneous. Described from frame 27 - 2d.	+137	+27

Objects of the third order of certainty

No. n/ n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
448	163	31 35 29	7 9, 5 64	A light spot. Position and dimensions taken from frame 31.	A white formation on a gray background. Possibly a crater. A rim is noticeable, the bottom differs little from the background. Described from frame 35 - 5.	+172°	+08°
449	170	31 27 35	9 3d 9	A light spot. Position, shape and dimensions taken from frame 31.	A light formation on a gray background. Possibly a mountain top. Described from frame 31.	+151	+04
450	173	31 29 35 27	9 10 9 3d	A dark spot. Position taken from frame 31.	A dark, crater-like formation on a gray back- ground. The bottom is inhomogeneous and differs little from the background. A hill and rim are noticeable. Described from frame 31.	+154	+02
451	188	29 31 32	9 9 9	A light spot. Position and dimensions taken from frame 31.	A gray formation on a dark background. Possibly a light area of a continent. Described from frame 31.	+146	-17
452	216	32 34 35	9 7 9	A light spot. Drawn from frame 32.	A gray formation with a clearly outlined contour on a dark background. Possibly a lighter area of the surface. Described from frame 32 - 9.	+143	-18
453	217	29 31	10, 6d 10	A dark spot. Drawn from frame 29.	A dark, crater-like formation on a gray back- ground. The bottom is inhomogeneous in intensity. Described from frame 29.	+158	-24
454	217a	29 31 36	10, 6d 10 8	A dark spot. Drawn from frame 29.	A dark spot on a gray background. Possibly a dark area on a continent. Described from frame 29.	+163	-28

Objects of the third order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
455	237	27 29 32	3d 8d 8	A light spot. Drawn from frame 29.	A light formation on a gray background. Described from frame 29.	+247°	-11°
456	437	26 32	1, 10, 11, 12 2, 4	A light spot. Position and dimensions taken from frame 26.	A light formation on a gray background. It includes an area possessing greater reflection ability. Apparently it consists of a number of small-sized craters. Described from frame 26 - 11.	+94	-17
457	461	28 36	20, 21 4, 5	A dark spot. Position, dimensions and shape taken from frame 36.	A dark, crater-like formation on a gray back- ground. The contour is not clear. Described from frame 36 - 4.	+96	-32
458	471	26 36	10 2, 7	A light spot. Drawn from frame 26.	A light region on a gray background. The contour is not clear. The formation consists of separate bright formations that look like mountain tops or craters. Described from frame 26 - 10.	+115	-38
459	487	26 28	11, 10 18, 23	A gray spot. Drawn from frame 26.	A gray, crater-like formation on a light back- ground. The contour is unclear. Described from frame 26 - 11.	+99	-60
460	488	26 28	9, 11 18	A gray spot. Drawn from frame 26.	A dark, crater-like formation on a light back- ground. The contour is not clear. Described from frame 27 - 11.	+107	-61
461	492	28 32	12 7	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray back- ground. The contour is not clear. Described from frame 26 - 12.	+105	-33

Objects of the third order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
462	493	26 36	12 4	A dark spot. Position taken from frame 26.	A gray, crater-like formation on a gray back- ground. The contour is not clear. A hazy rim appears in the southeast. Described from frame 26 - 12.	+104°	-35°
463	494	26 36	12 4, 5, 3	A dark spot. Position and dimensions taken from frame 26.	A dark, crater-like formation on a gray back- ground. Bordered by a hazy, discontinuous rim. Described from frame 26 - 12.	+99	-33
464	503	29 27 35 31	4 3d 3 3	A dark spot. Drawn from frame 27.	A dark, cirque-like, elongated formation. A rim is discernible.	-178	-15
465	503a	29 27 31	4 3d 3	A dark spot. Drawn from frame 27 - 3d.	A dark formation. Possibly a crater. A rim is discernible. There seems to be a hill in the south.	-179	-18
466	507	31 27	4 3d	A dark spot. Drawn from frame 31.	A dark, crater-like formation on a gray back- ground. A rim is discernible.	+174	-41
467	509	31 29 35 27	4 10 3 3d	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray back- ground. A hazy discontinuous rim is discernible. The bottom is inhomogeneous in intensity. Described from frame 31 - 4.	+159	-57
468	510	31 29 35	4, 8 10 3	A light spot. Drawn from frame 31.	A light formation on a gray background. Possibly a crater. The rim is discernible only in places. The bottom differs little from the background. The boundary is hazy. Described from frame 31 - 4.	+138	-49

Objects of the third order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
469	511	31 29 27	4, 10 10 3d	A dark spot. Drawn from frame 31.	A dark formation on a gray background. Possibly a crater. The bottom differs little from the background. A rim is slightly noticeable only in some places. The outline is not clear. Described from frames 27 - 3d and 31.	+152°	-04°
470	512	31 29 27	4 10, 8d, 7d 3d	A light spot. Drawn from frame 29.	A light, crater-like formation on a gray background. The rim is discontinuous. The bottom is inhomogeneous. The outline is unclear. Described from frame 29 - 10.	+148	+02
471	513	31 29 35	4, 9, 10 64, 10 3	A light spot. Drawn from frame 29.	A light formation on a gray background. Possibly a crater whose rim is discernible. The bottom is inhomogeneous and differs little from the background. Possibly there is a hill. The outline is not clear. Described from frame 31 - 4.	+146	-10
472	514	31 29	4, 8 10	A dark spot. Drawn from frame 31.	A dark, crater-like formation on a gray background. A discontinuous rim is discernible. Possibly there is a central hill. The outline is unclear. Described from frame 31.	+156	-08
473	515	31 29 35	4, 8 10 3, 9	A light spot. Drawn from frame 31.	A light, sprawled-out formation on a gray background. Possibly a crater. The inhomogeneous bottom differs little from the background.	+157	-13
474	516	31 35 29	12, 9 3, 7 67, 10	A light spot. Drawn from frame 31.	A light formation on a gray background. Possibly a crater. The bottom differs little from the gray bottom. Described from frame 31 - 4.	+157	+52
475	518	31 29	9, 4 10d	A dark spot. Drawn from frame 29.	A dark, elongated formation on a gray background. Situated near the limb. It looks like a cirque whose hazy, discontinuous rim is discernible. Described from frame 29.	-178	+39



Objects of the third order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
476	518a	31 29	9, 4 10d	A dark spot. Drawn from frame 29.	A dark, cirque-like formation on a gray back- ground. A hazy rim is discernible. Situated near the limb. The outline is unclear. Described from frames 29 and 31.	-175 <sup>0</sup>	+37 <sup>0</sup>
477	519	31 29	3 8d	A dark spot. Drawn from frame 29.	A dark cirque-like formation on a gray back- ground. The outline is unclear. Described from frames 29 and 31.	-171	+33
478	520	31 29 35	3, 4 10 7	A dark spot. Drawn from frame 29.	A dark formation on a gray background. Possibly a crater. A hazy rim is noticeable. Described from frames 29 and 31.	-177	+28
479	525	31 35 29	3 8 9d	A dark spot. Drawn from frame 31.	A dark, elongated formation on a gray background. Possibly a crater whose discontinuous rim is discernible. A slightly lighter area is noticeable in the south - possibly this is a hill. Described from frames 29 and 31.	+170	+37
480	526	29 31	10 9	A dark spot. Drawn from frame 31.	A dark, crater-like formation on a gray back- ground. The bottom is inhomogeneous. There is a slightly lighter spot - which may be a hill. A hazy, discontinuous rim is discernible. Described from frame 31.	+143	-59
481	532	29 31	9d, 8d 9	A dark spot. Drawn from frame 29.	A dark, crater-like formation on a gray back- ground. The rim is barely discernible. The outline is unclear. Described from frame 29.	-176	+50

Objects of the third order of certainty

No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
482	534	31 29	9, 12 10d	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray back- ground. The bottom differs little from the back- ground. A rim is discernible in places. The outline is unclear. Described from frame 29.	+175 <sup>0</sup>	+57 <sup>0</sup>
483	535	31 29 35	12 8d 7	A dark spot. Drawn from frame 31.	A dark, elongated formation on a gray background. Possibly a crater. Bounded by a hazy rim that is more noticeable in the north. Described from frames 29 and 31.	+165	+46
484	537	35 29 31	8 2, 67 12	A light spot. Drawn from frame 35.	A light, crater-like formation on a gray back- ground. The bottom differs little from the gray background. Outlined unclearly by a discontinuous rim. Described from frames 29 and 35.	+150	+56
485	538	31 29	13 10d	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray back- ground. The bottom differs little from the back- ground. Bounded by a hazy rim that blends in with the background in places. Described from frames 29 and 31.	+145	+48
486	539	31 26 27	13 10 3d	A light spot. Drawn from frame 31.	A light formation on a gray background. Possibly a crater whose bottom differs little from the background. Bounded by a barely noticeable rim. Described from frame 31.	+144	+42
487	540	31 27	13 3d	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray back- ground. Bordered in places by a discernible rim. Described from frames 27 and 31.	+139	+47
488	553	31 36	12 1	A light spot. Drawn from frame 31.	A light, crater-like formation on a gray formation. Bounded by a discontinuous, hazy rim. Described from frame 31.	+126	- 16

Objects of the third order of certainty

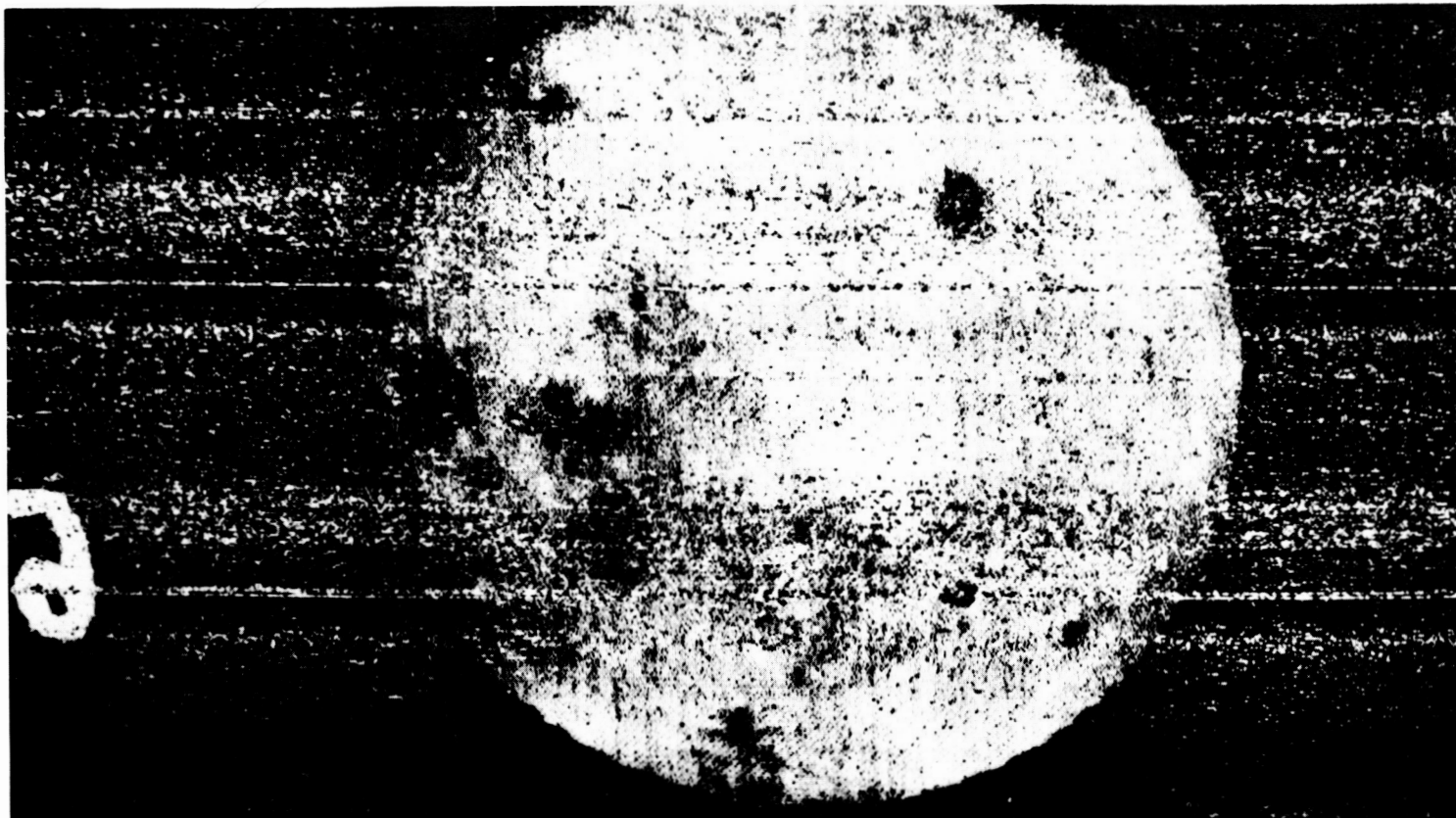
No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
489	602	26	12, 1	A light spot. Drawn from frame 26.	A light formation on a gray background. Looks like a mountain top. Described from frame 26.	+101°	-18°
490	608	26	12, 11, 2	A light spot. Drawn from frame 26.	A light, somewhat washed-out formation on a gray background. Looks like a bright crater. Described from frame 26 - 12.	+97	-12
491	610	26	1, 11, 12	A light spot. Drawn from frame 26.	A bright, small object on a gray background. Looks like a mountain top. Described from frame 26 - 12.	+101	-11
492	611	26	11, 12	A dark spot. Drawn from frame 26.	A dark crater-like formation on a gray background. Bordered by a light rim that blends in with the background in places. The bottom is apparently inhomogeneous. Described from frame 26 - 12.	+116	-12
493	612	26	11, 12	A dark spot. Drawn from frame 26.	A dark, crater-like formation on a gray back- ground. Bounded in the northeast by a hazy, light rim, which differs little from the surrounding background in the southwest. Described from frame 26 - 11.	+117	-12
494	620	26 29	12, 1 10, 67	A dark spot. Drawn from frame 26.	A gray formation on a light background. The contour does not stand out clearly. A number of lighter, crater-like formations are noticeable within the contour. Described from frame 26 - 2.	+115	-15
495	623	26 28	12, 10 18	A gray spot. Drawn from frame 26.	A gray crater-like formation on a light back- ground. The contours are unclear. Described from frame 26 - 11.	+108	-55

Objects of the third order of certainty

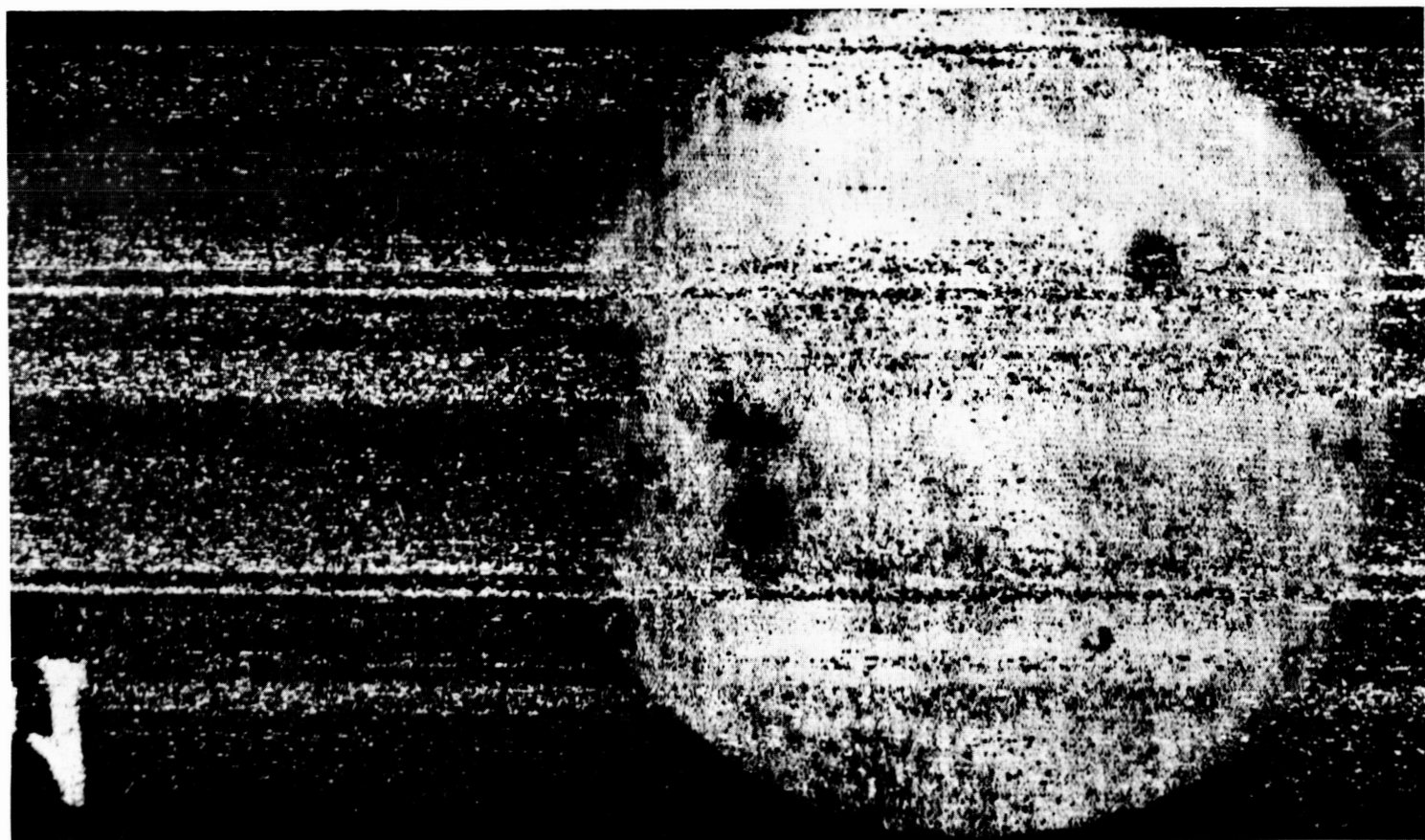
No. n/n	Object and its Name	Frame	Photometric Cross Section	Object of Analysis	Description of Object	Coordinates of Object	
						$\lambda$	$\beta$
496	633	26 36 27	14, 2, 1, 4 3, 4, 1 3d	A gray spot. Drawn from frame 25.	A gray, crater-like formation on a light back- ground. Bounded on the north and south by broad dark bands. The bottom is inhomogeneous and is lighter in the north. Described from frame 26 - 14.	+103°	+16°
497	677	26 36	4, 14 1, 2, 4, 6, 7	A gray spot. Drawn from frame 36.	A gray, crater-like formation on a light back- ground. Bordered by a hazy rim. The bottom is inhomogeneous and differs little from the sur- rounding background. The boundary is unclear. in the west. There is no clearly-shown formation at this spot in Wilkins' map. There is a small crater on Neison's map. Described from frame 36 - 7.	+70	+52
498	721	26 32	9d, 10d 10	A light spot. Drawn from frame 26.	A light formation on a gray background. A radio disturbance spot on frame 26 covers up only the southern part of the rim. This is apparently a crater. Described from frame 32.	+123	+62

THE UNIVERSITY OF MICHIGAN

PHOTOGRAPHS OF THE FAR SIDE OF THE MOON



PHOTOGRAPH 1



PHOTOGRAPH 2

26 2



PHOTOGRAPH 3



26-3

o



PHOTOGRAPH 4



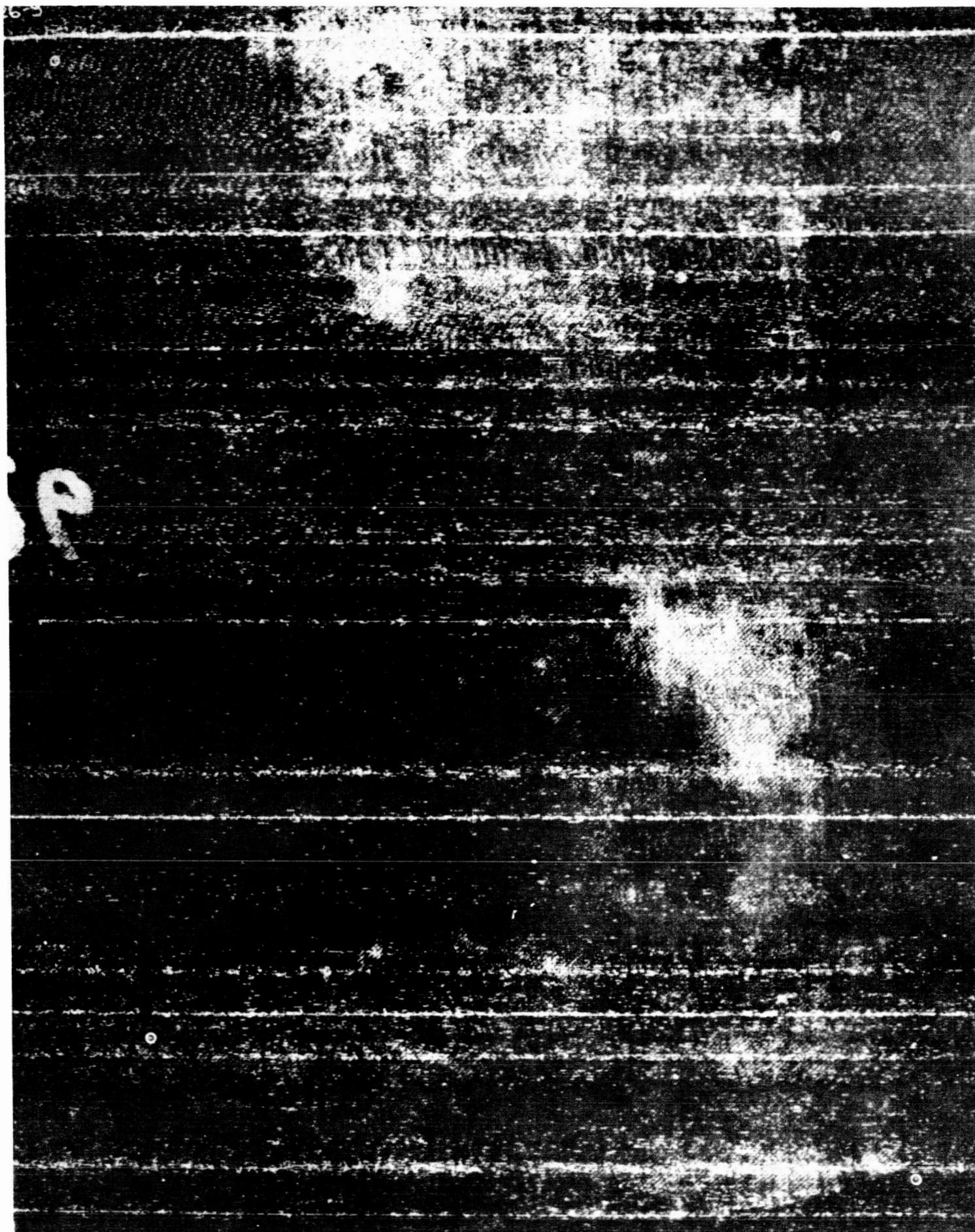


PHOTOGRAPH 5

26-4



PHOTOGRAPH 6



PHOTOGRAPH 7





PHOTOGRAPH 8

26-11

SP

PHOTOGRAPH 9

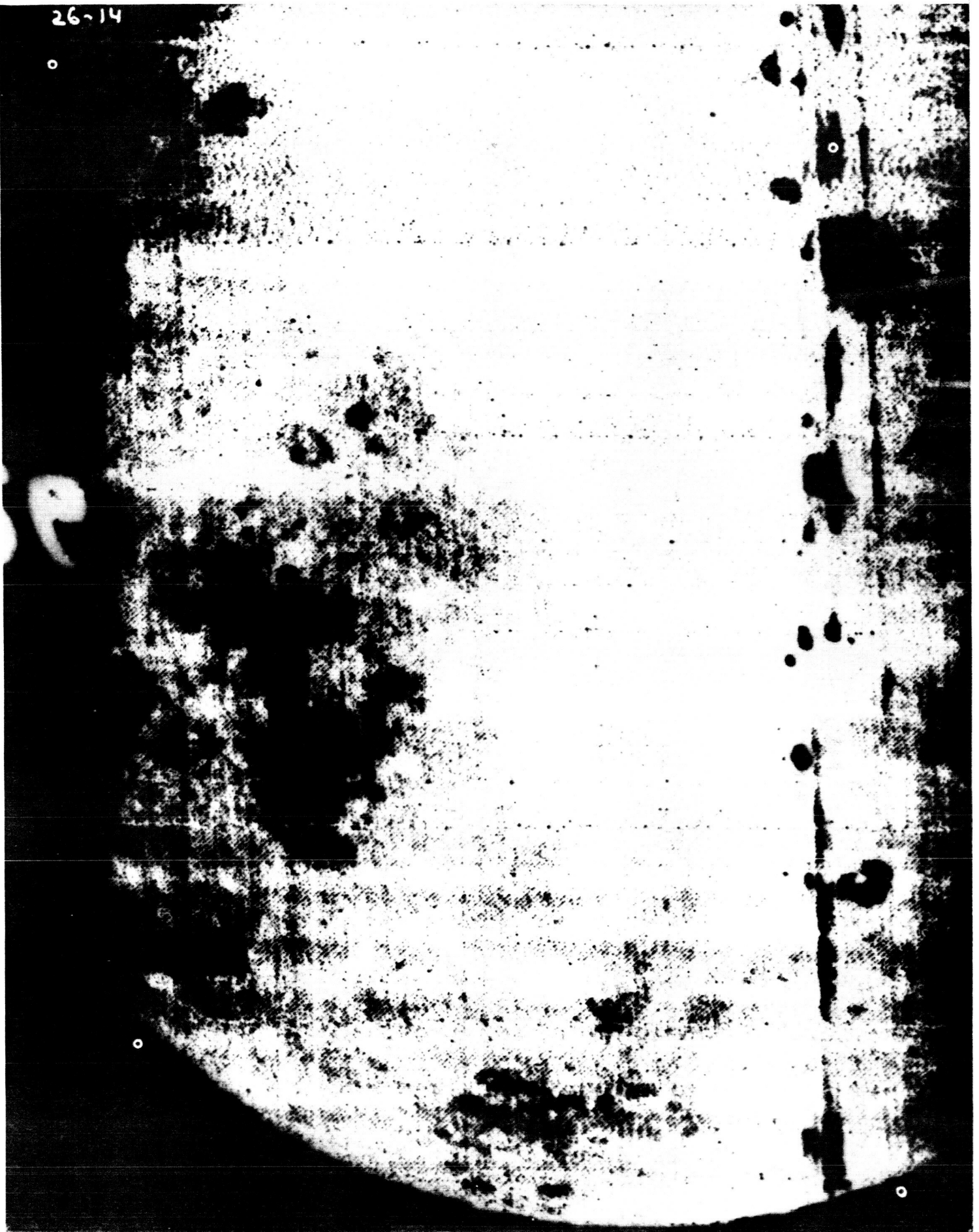


6-12

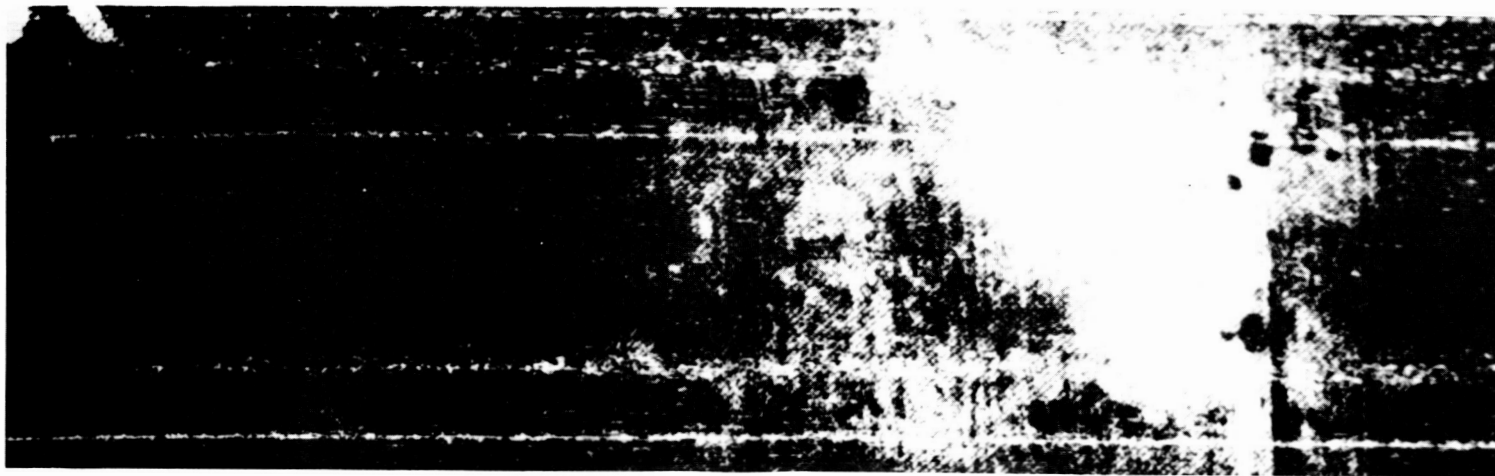


PHOTOGRAPH 10

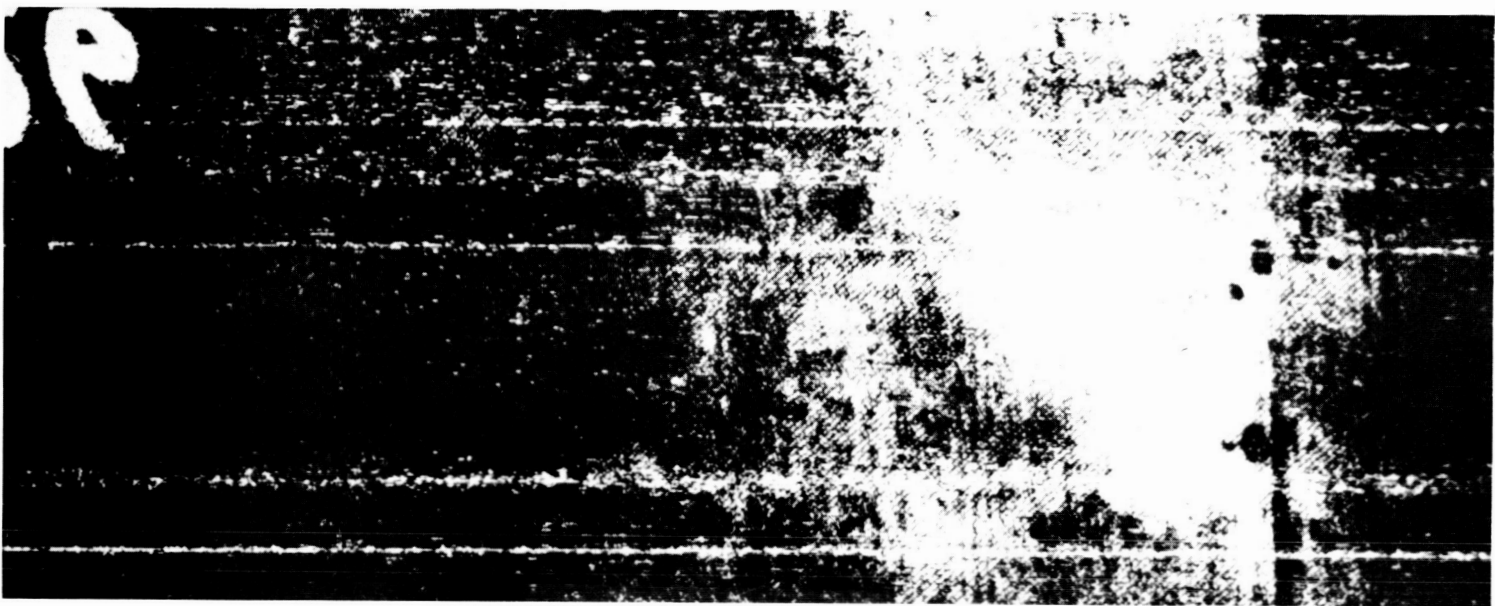
26-14



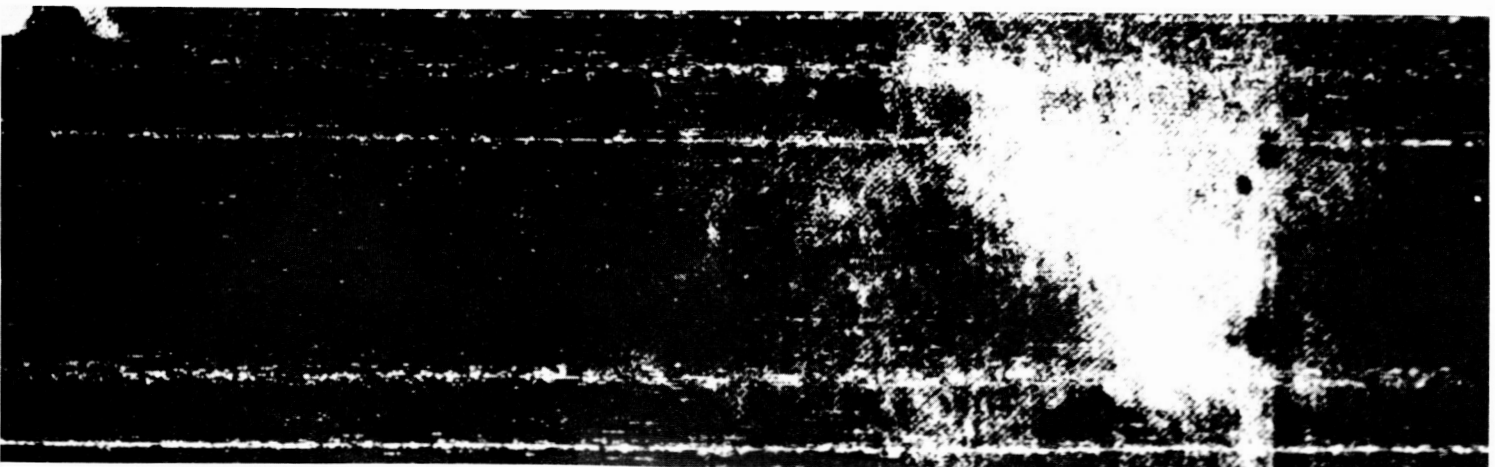
PHOTOGRAPH 11



PHOTOGRAPH 12

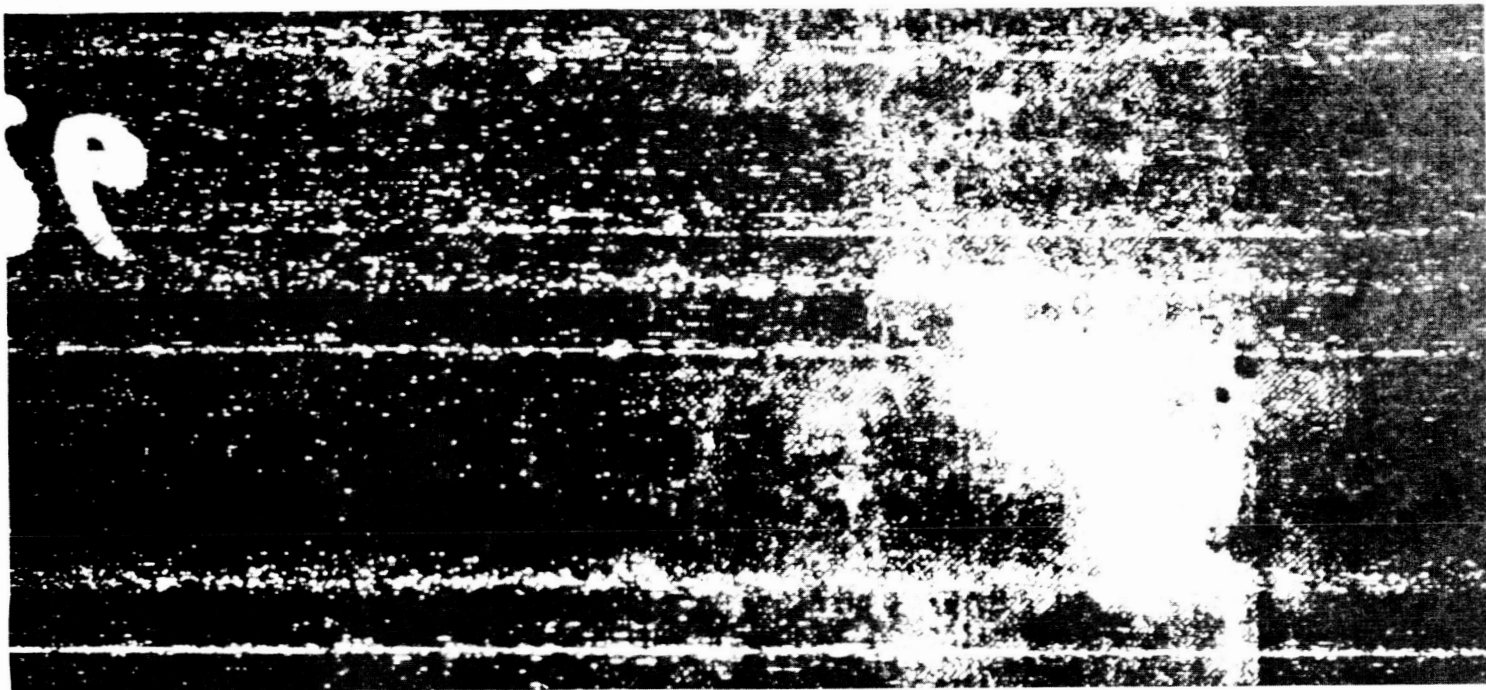


PHOTOGRAPH 13

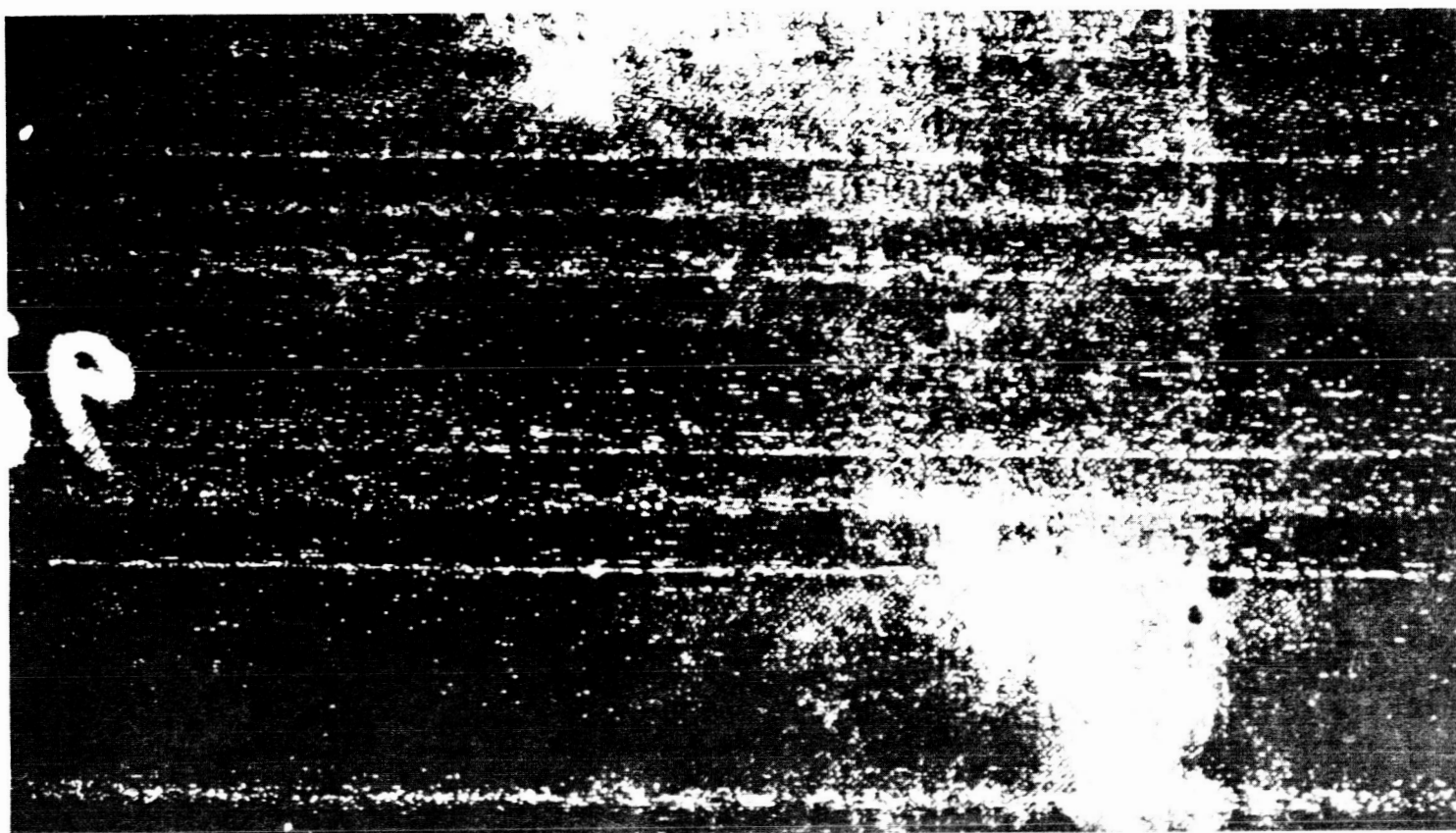


PHOTOGRAPH 14

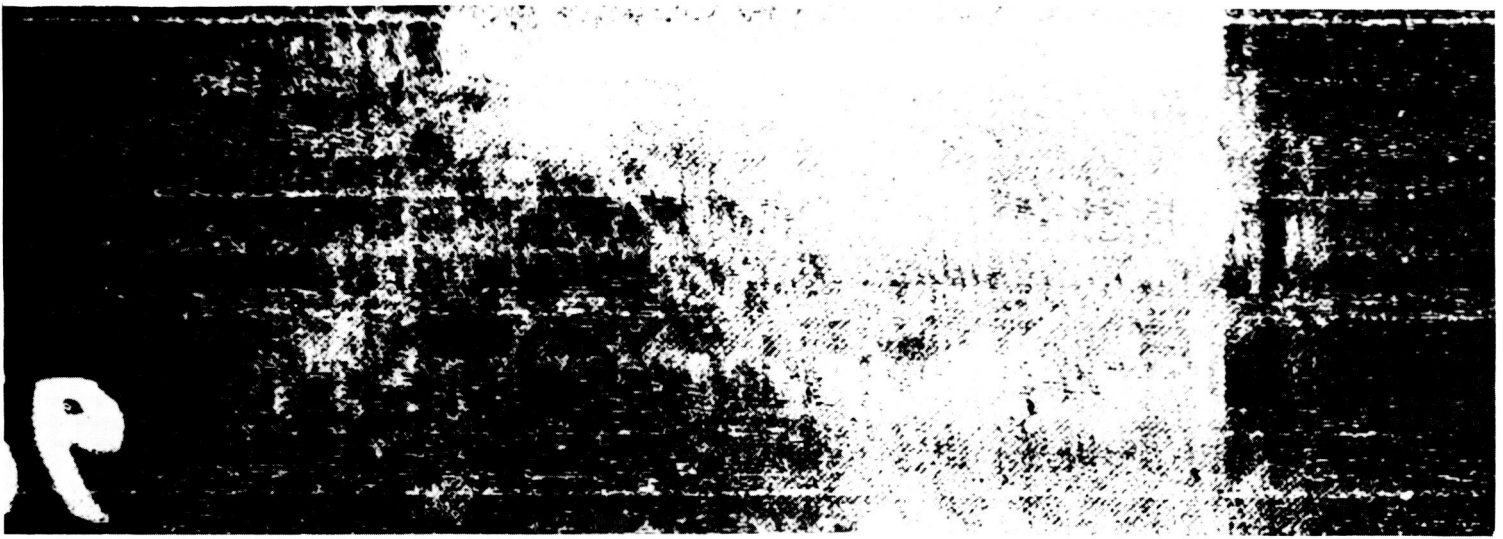




PHOTOGRAPH 15



PHOTOGRAPH 16



PHOTOGRAPH 17



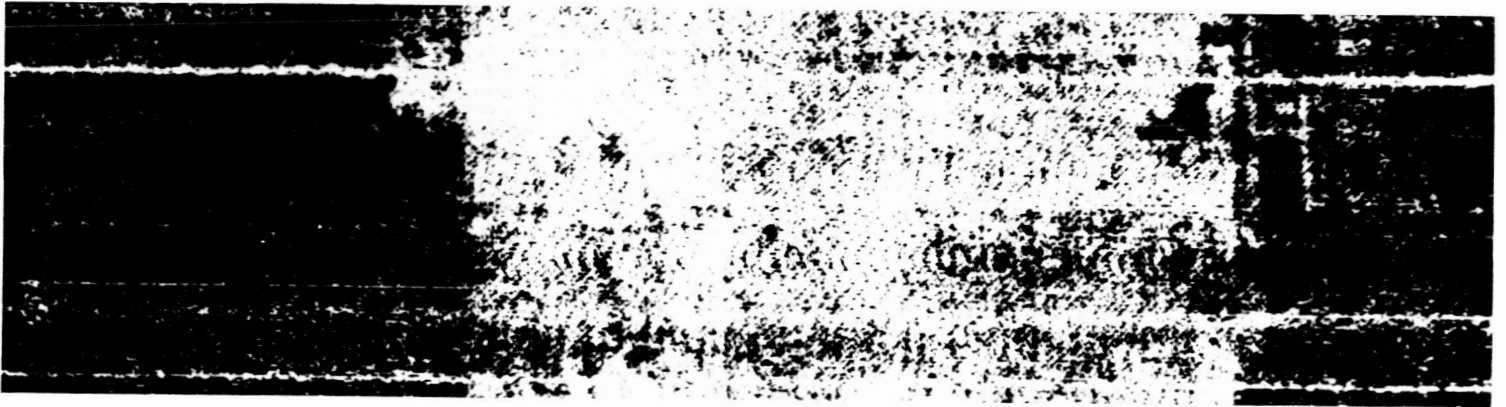
PHOTOGRAPH 18



PHOTOGRAPH 19



PHOTOGRAPH 20

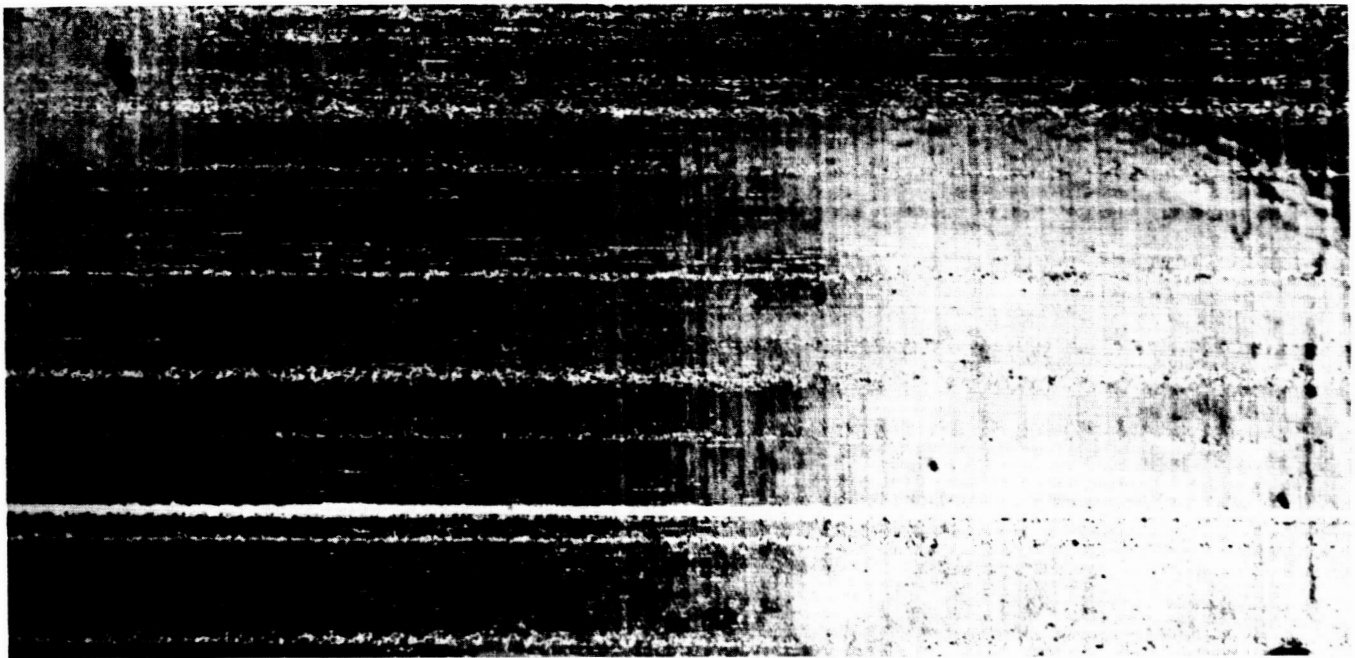


PHOTOGRAPH 21

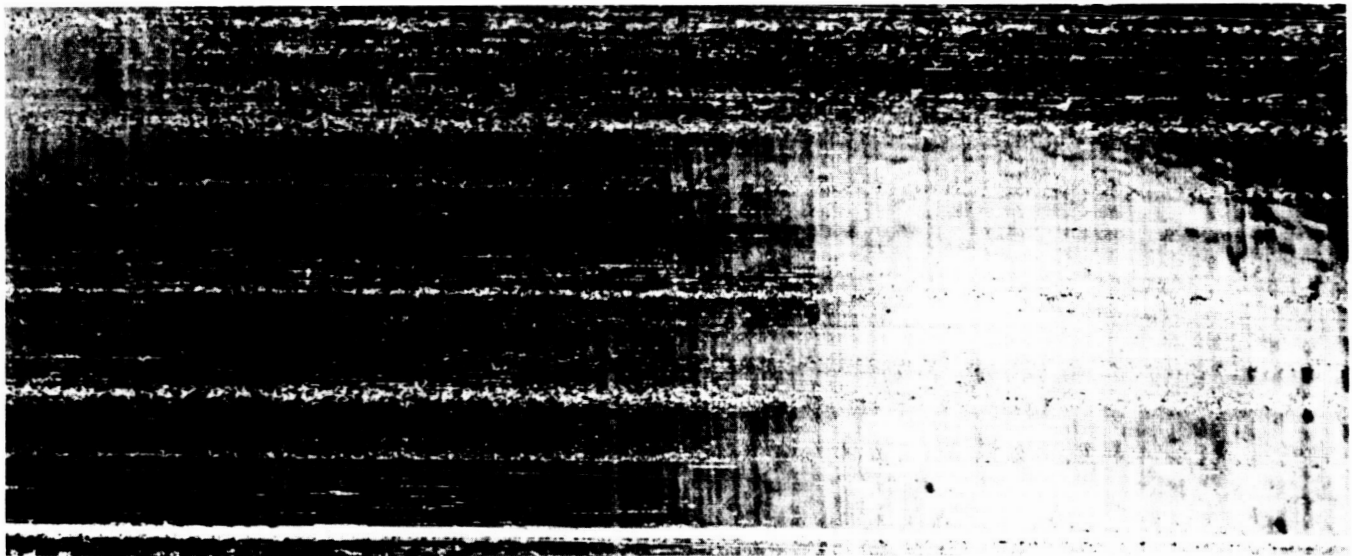


PHOTOGRAPH 22

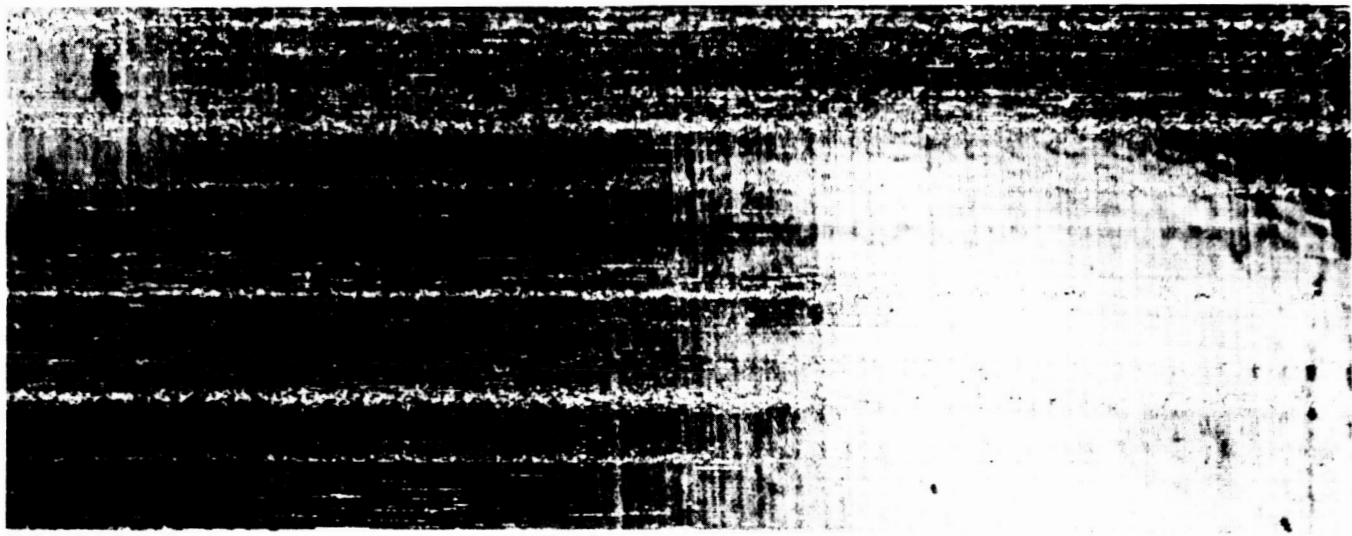




PHOTOGRAPH 23



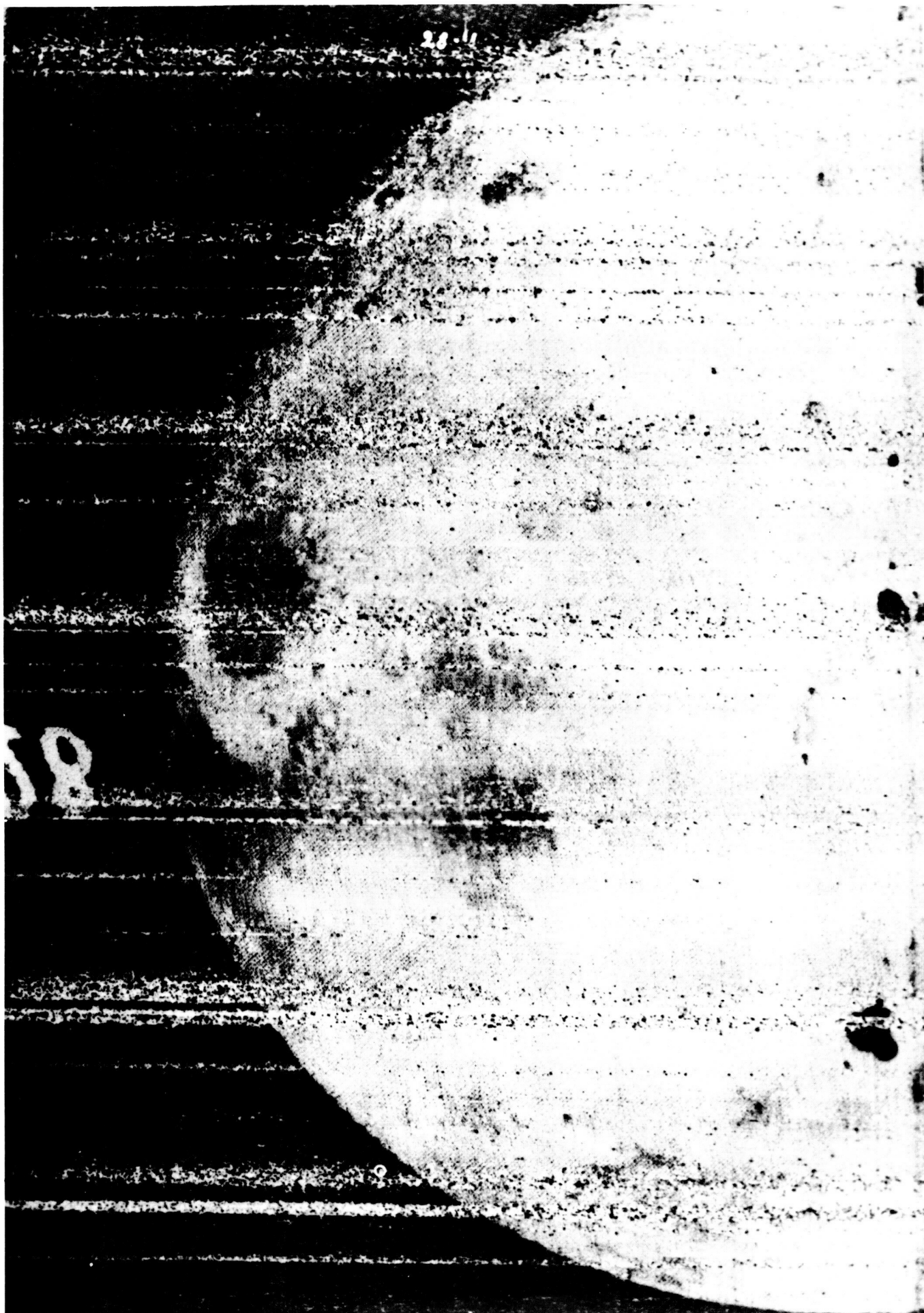
PHOTOGRAPH 24



PHOTOGRAPH 25

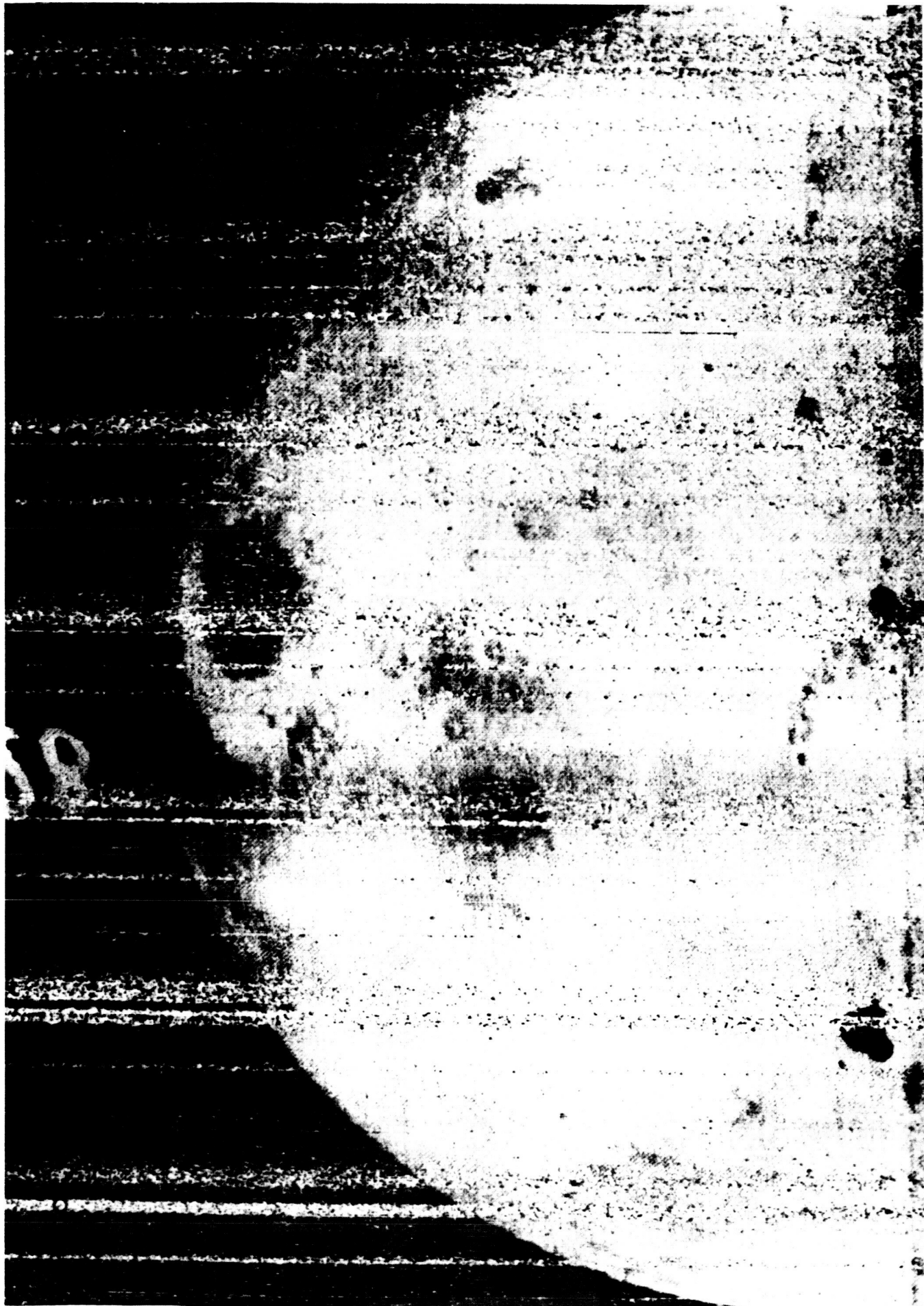


PHOTOGRAPH 26



PHOTOGRAPH 27





PHOTOGRAPH 28



PHOTOGRAPH 29





PHOTOGRAPH 30